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Original Study

BREAST CANCER HISTOLOGY PROFILE: A SIX-YEAR SURVEY OF BREAST CANCER HISTOLOGY SAMPLES IN FIJI (2009 TO 2014)

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ABSTRACT

Introduction: Breast cancer is a major health problem in Fiji. There are very few literature found on breast cancer in the Pacific. This study aims to provide a platform for future studies on breast cancer, by describing the demographics of breast cancer in Fiji, based on histological reports analysis.

Method: This was a retrospective study of histologically-diagnosed breast cancer specimens in Fiji between 2009 and 2014. Histological reports of the eligible samples were screened and information regarding the following variables were collected and analysed.

Results: Breast cancer cases are increasing over the years. There are 840 breast cancer cases noted, 20 of which were from male patients and 817 from females. The Ethnic group distribution shows 481 samples from the iTaukei Ethnic group, 327 samples were from the Fijian-of-Indian Descent (FID) group. Breast cancer is seen throughout all age groups, however majority of the cases are distributed between the age of 30 and 70 years. The majority of the Tumour sizes falls in between 2cm and 5cm. Grade 2 is the commonest grade that we see and there are usually more than 3 lymph nodes involved. The left and right breast have similar occurrence for cancer. There is an increase of Positive ER and PR cases. More ITaukei in the Central/Eastern division are diagnosed with Breast cancer, whilst there are more FID in the Western division diagnosed with breast cancer. Breast cancer incidence is 54.9/100000 population and this is lower than figures from Australia (118/100000) USA (125/100000) and UK (164/100000).

Conclusion: There is an increase in breast cancer cases in Fiji. The incidence of breast cancer is lower than figures from developed countries. People living in rural areas have lower incidence of developing breast cancer. Incomplete histology report is a problem in Fiji. Further studies need to be carried out, to profile each variable in detail.

Key Words: *Breast cancer, Histology*

INTRODUCTION

Fiji is a tropical and multicultural Island nation located in the South Pacific and it is 2000 km northeast of New Zealand [1]. The last national census, showed a population of 837,271 where 56.82% are iTaukei, 37.48% are FIDs and 5.70% makes up of other ethnic groups [2]. Males make up 51.09% of the population while females accounts for 48.91% [3]. There are 220 Health facilities in Fiji, but histology service is only offered in the 3 divisional hospitals – Colonial War Memorial Hospital (Suva), Lautoka Hospital and Labasa Hospital [4]. The Ministry of Health annual reports showed figures of breast cancer in Fiji from 2010 to 2014. The number of cases ranges from 164 to 217 new cases per year. In 2014 the rate of breast cancer in Fiji is 58 cases per 100,000 populations [4]. In comparison, Australia's breast cancer incidence is 118 cases per 100,000 [9], USA is 125 cases per 100,000 [10] and UK has got an incidence rate of 164 cases per 100,000 [11]. The incidence rate for breast cancer is actually low when compared to the international statistics.

Breast cancer is the commonest female cancer. Cancers are composed of uncontrollable cells that invade and indirectly destroy adjacent tissue [6]. The Nottingham Breast Cancer Index is used to predict the severity of breast cancers and the sum of score from variables determines the prognostic outlook of the cancer. [7] These variables include size of the tumour, and lymph node involvement. However, instead of tumour distant metastasis our study describes tumour grades.

Revolutionary studies have been conducted over the years and they are all promoting the superiority of molecular studies over normal histological studies. Lips et al confirmed that if clinical finding was used together with immunochemistry and histology grading (all available in Colonial War Memorial Hospital) the quality of information generated is just as good as the information received from molecular studies. It is also mentioned in Lips et al study that molecular investigation is expensive to be part of day to day, breast cancer investigation [26].

For cancer management, early detection is important in trying to cure the cancer [15]. Patient awareness of breast cancer will help in the making of decision to seek medical treatment early. They will need information on the nature of breast cancer, when to suspect it and the benefits of having regular check-up if one is at risk [16].

As discussed by Liao et al, it is crucial to incorporate multidisciplinary approaches to diagnosing breast cancer. Any of these discipline (histology, radiology or clinical) on its own can miss a significant amount of breast cancer or over diagnose cases [17]. Schmidt et al found that ultrasound (comes under the radiology department) alone can miss 16% of breast cancer cases [18].

At the moment tumour grade is not part of the Nottingham Breast Cancer index. It only includes PT (tumour size), PN (lymph node involvement) and PM (tumour metastases). A study conducted by Emad et al shows that lymph node involvement and tumour grade provides a more accurate prognostic index. The above group are recommending the inclusion of Tumour grade to the Nottingham Breast Cancer Index [23]. Tumour grade two is the most common tumour grade that is seen in Fiji. Limitations of the tumour grading system is that it is mainly subjective to the diagnosing Pathologist and it is difficult to reproduce the same results, amongst different pathologist to diagnose.

The hormonal receptor stain is a test that helps with decision on chemotherapy options. This study looks at some of those demographic variables together with variables that are measured by the Nottingham Breast cancer index.

AIM

To describe the demographics of histologically-diagnosed breast cancer reports in Fiji, between 2009 and 2014.

OBJECTIVES

1. To describe breast cancer in Fiji into gender, ethnicity, age groups, site of cancer, procedure, cancer grade, tumour size, lymph node involvement, hormonal status and medical zones.

2. To compare the local data with regional and global data

METHODOLOGY

This is retrospective study, where by the breast cancer cases from the three divisional hospitals in 2009 to 2014, were profiled. The reports were profiled according to each demographic and histological variable.

The studied variables for breast cancer cases include: Specimens, Age, Ethnicity, Gender, Site and Procedure, Tumour size, Cancer grade, Lymph node involved, Hormonal Receptor Stain status and Medical divisions.

The 'Documents and records data collection techniques' were used, whereby, the histology report for breast cancer cases were used as the source of data [19].

The inclusion criteria consist of histologically-identified breast cancer reports from the three tertiary hospitals between 2009 and 2014. Excluded are cases with multiple entries of the same patients and reports with absent or insufficient histological specimens

Ethical approval for conducting this study was obtained from College Health Research Ethics Committee (CHREC) and Fiji National Health Research Committee (FNHRC). Permission to collect the data from the three divisional hospitals was obtained from the respective medical superintendents. There were no confidentiality issues, since no personal identifiers were included (except the unique laboratory numbers to allow retracing of reports).

RESULTS

Out of all total specimens for histology collected in the study period (n= 32497), 6.9% (n=2244) were breast specimens, with breast cancer found in 2.6% (n=840) (Table 1). This accounts for 37.4% of the total breast specimens taken. Breast cancer is unanimously was a disease of the female, although there were 20 (2.4%) cases of breast cancer in males in the study period.

In terms of age distribution (Table 2), the percentage of cases that fall in between age of 30 and 69 is 85.1%. About 2.6% of the cases are below 30 years of age; 12.2% are older than 69. The youngest patient with breast cancer was less than 10 years.

Over the years, the number of breast cancer for the iTaukei ethnic group had increased dramatically compared to the other ethnic groups. Moreover, the total

number of breast cancer cases is high amongst the iTaukei ethnic group (48.6%) (Table 3). However, total population at risk for each ethnic group has to be taken into consideration. As an example, in 2014, there were estimated population of 513,022 iTaukei with 101 (19.7 per 100,000) having breast cancer; 338,703 FID with 70 (20.7 per 100,000) having breast cancer, and 40,644 Others with 5 (12.3 per 100,000) having breast cancer.

More iTaukei have breast cancer in the Central/Eastern division, while more FID have breast cancer in the Western division (Table 3). The northern division initially showed higher incidence of breast cancer amongst FID but then at the end of the study period the ITaukei figures passed the FID numbers. A significant number of received specimens were missing the size and ethnicity information. However, the FID women with breast cancer generally presented with small size tumours, while more iTaukei presented with big tumours that have already infiltrated the surrounding structure. There is consistent high numbers of tumour that size falls in between 2cm and 5cm (Table 4).

There were generally more mastectomies than biopsies of the breast, but since all of the excluded samples are biopsies, this lower biopsy numbers are false. There was similar numbers of left breast (42.3%) and right breast (43.4%) cancer occurrences (Table 5). Non-orientated breast sample accounts for 14.4%. Majority of breast cancer, with an identified grade shows intermediate (grade 2) tumour. Grade two cancers are the most common grade in Fiji and accounts for 46.5% followed by Grade 3 (30.1%) and then Grade 1 (23.4%) (Table 6). Majority of the tumours show metastasis to more than 3 lymph nodes. Most of the females in their 50s have more than three lymph node metastasis (Table 7).

A lot of mastectomy specimens did not have the hormonal status tested (51.4%). Out of the valid data, 26.8% of the tumours are positive for oestrogen receptors stain, while 21.7% test are negative. About 49.8% of the progesterone receptor test was not done; 26.8% of the tested breast cancers were positive and 23.4% were negative (Table 8).

Table 1: Specimens collected

Year	Total specimens	Breast specimens	Breast cancer
2009	5039	327	117
2010	5076	351	132
2011	5730	351	110
2012	5409	350	133
2013	5191	415	171
2014	6052	450	177
Total	32497	2244	840

Table 2: Age Distribution of Breast Cancer cases

Age	n	%
0 to 9y	1	0.1
10y to 19y	2	0.2
20y to 29y	19	2.3
30y to 39y	82	9.8
40y to 49y	204	24.3
50y to 59y	227	27.0
60y to 69y	188	22.4
70y to 79y	91	10.8
Over 80y	10	1.2
Missing data	16	1.9
Total	840	

Table 3: Ethnicity and Division Distribution of Breast Cancer cases

	Central / East	Northern	Western	Total (Ethnicity)
iTaukei	234	59	115	408 (48.57%)
FID	118	61	224	403 (47.98%)
Others	15	4	10	29 (3.45%)
Total (Division)	367 (43.69%)	124 (14.76%)	349 (41.55%)	840

Table 4: Tumour size in breast cancer cases

Size	n	%
0 to 2cm	46	5.5
2cm to 5cm	120	14.3
>5cm	107	12.7
Infiltrate adjacent structure	70	8.3
Missing data	497	59.2
Total	840	100

Table 5: Site and Procedure of Breast Cancer cases diagnosed

Site	n	%
Left breast biopsy	166	19.8
Right breast biopsy	167	19.9
Breast biopsy (side not recorded)	64	7.6
Left breast mastectomy	189	22.5
Right breast mastectomy	197	23.5
Mastectomy (side not recorded)	57	6.8
Total	840	100

Table 6: Tumour grade in breast cancer cases

Grade	n	%
Low (Grade 1)	88	10.5
Immediate (Grade 2)	175	20.8
High (Grade 3)	113	13.5
Missing data	464	55.2
Total	840	100

Table 7: Node involvement in breast cancer cases

Lymph node involvement	N	%
No lymph node involvement	79	9.4
1 to 3 node involvement	83	9.9
More than 3 node involvement	137	16.3
Missing data	541	64.4
Total	840	100

Table 8: Oestrogen and Progesterone receptor stain test			
Oestrogen receptor stain test	N	Progesterone receptor stain test	N
Positive	90	Positive	87
Negative	73	Negative	76
Not done	173	Not done	162
Missing data	504	Missing data	504
Total	840	Total	840

DISCUSSION

Specimens: Over the six years of study there are 32,497 histology specimens taken, of which 2,244 specimens were from the breast and 840 cases are cancer. Breast cancer makes up 37.4% of all breast samples taken. The other 62.6% are benign lesion. (Table 1)

Age: Increasing age is one of the well-established risk factor for breast cancer [6]. According to the Cancer Research UK [11], about 45% of Breast cancer in the United Kingdom are aged 65 and above, however, in Fiji 23.3% of breast cancer are from the same age group range. This signifies that Fiji's peak breast cancer age group includes younger age groups compared to international breast cancer peak age groups. Familial/genetic related breast cancer often develops in younger (less than 40 years) females, which is linked to BRAC 1 and BRAC 2 gene mutation. Females younger than 40 years accounts for about 5% of breast cancer cases in the United States of America [21]. Younger age group (Birth to 39 years) accounts for 12% in Fiji. If Fiji were to set up a BRAC gene mutation screening programme, a potential of 12% of breast cancer patients may benefit from knowing their risk of developing breast cancer. A shortcoming was that 14.4% of all the breast cancer specimens did not have the age entered on the form.

Ethnicity: The Centre for Disease and Control (CDC) confirmed that Asian and Pacific Islanders ethnic group have the second lowest incidence for breast cancer, while the Hispanic have the lowest in the United States of America [22]. Over the years, the number of breast cancer for the iTaukei ethnic group has increased dramatically compared to the other ethnic groups. The total number of breast cancer is high amongst the iTaukei ethnic group. However the incidence rate for FID ethnic group is higher than the iTaukei ethnic group. The FID shows 21 cases per 100,000 populations while the iTaukei showed 20 cases per 100,000 populations. The Others ethnic groups accounted for only 12 cases per 100,000 populations. Overall the Fiji incidence rate is much lower than the Pacific Islanders and Asian in the United States which is 88.3 per 100,000 [10]. The ethnic group distribution per medical zones shows obvious differences. The Central/Eastern division show predominance of iTaukei with breast cancer. Western division shows a predominance of FID cases of breast cancer and the Northern division initially shows high FID numbers (later in the study it changed to the iTaukei ethnic group). This may be reflective of the different population density of each ethnic group per medical division. The correlation of age group and ethnicity showed that more iTaukei have breast cancer very early and later in life.

Gender: Being a woman is the greatest risk factor for breast cancer. In 2014 the incidence for breast cancer amongst females in Fiji is 38.8 per 100000 population, while Male are 0.7 per 100000 population. The incidence for male breast cancer in this study is the same as male breast cancer incidence in Fiji described by Singh et al (2010), which is 0.7 per 100000 populations [12].

Site and Procedure: There is generally more mastectomy than biopsies of the breast. There should be equal or more biopsy compared to mastectomy. Due to the exclusion criteria a lot of biopsies were eliminated. There are similar numbers of left to right breast cancer occurrences; right breast in 43.4% and left breast in 42.3%.

Tumour size: The size of the tumour is mainly reported on mastectomy samples. Biopsy samples do not have the tumour size reported in the description of the tumour. There are 397 biopsies, but there are 497 samples that do not have the tumour size reported. It is 100 specimens more and this extra 100 specimens are mastectomy cases that do not have the size entered. Most of the reported tumours are between 2cm to 5cm, followed by tumours more than 5cm in size (31.2%) and then tumours less than 2cm in size (13.4%). The smaller breast tumour groups are slowly increasing at the end of the study period.

Breast Cancer Grade: Breast cancer samples from mastectomies should consist of the entire tumour, in order to measure the size of the tumour. The worst looking area is used to predict the grade of the tumour, and tumour grade is important in the prediction of the behaviour of the cancer. Majority of breast cancer, with an identified grade shows intermediate (grade 2) tumour. Grade two cancers as the most common grade in Fiji and accounts for 46.5% followed by Grade 3 (30.1%) and then Grade 1 (23.4%). In the USA the commonest grade is grade 3 (45.6%) followed by grade 2 (35.6%) and then grade 1 (18.6%) [10]. There are smaller size tumours in low grade cancer compared to higher grade tumour; generally high grade tumours show bigger tumour size.

Node Involvement: With the high frequency of multiple node involvement, it is hypothesised that most of the breast cancer patient present late to hospital, as it takes

a long time from development of cancer to the removal of the cancer.

Hormonal Receptor Status: Performing hormone receptor study on breast infiltrating ductal carcinoma is important to the clinical course and treatment of patient. If the tumour is positive for oestrogen receptor stain, the patient will do well with target therapy (example tamoxifen) [25]. Initially there were a lot of Oestrogen receptor stain and Progesterone receptor stain negative tumour in 2009. The number of both hormonal status negative tumours gradually declined over the years while both hormonal status positive tumours increases over the similar period. Apart from the actual change in the tumour hormonal status over that particular period, another explanation for the trend could be gravitated towards technical skills of the immunohistochemistry technician, performing the test. All of the immunohistochemistry tests are done manually, and the outcome of the test is dependent on the skills of the technical officer. In the beginning of the study in 2009 the technical officer was relatively new to the art of performing immunostains. Over the years, as the technical officer's skills improved, there was an increase in the number of oestrogen and progesterone receptor stain positive tumours.

Medical Division: The incidence of getting a histology sample taken from a certain geographical division is highest in the Western division, followed by Central/Eastern Division and lowest in the Northern Division. Central and Western Division are generally urban areas while the Northern division is a mix of semi urban and rural region of Fiji.

Statistics: Australia, United States of America and the United Kingdom cancer statistics estimated in 2012 that in every 8 females 1 will develop breast cancer in their life time [24]. However figures from Fiji shows that in every 44 females 1 will develop breast cancer. This figure is not directly comparable since the calculation depends on the life expectancy of the particular geographical community. The life expectancy in those developed country ranges from 84 to 87 years for females and for Fiji it is 79 [13, 14, 15] Mortality rate for breast cancer is estimated to be as high as 60% and less than 50% of this breast cancer patient received standard medical treatment [5].

Conclusion

Each year there is an increase in the number of histology samples and the number of breast cancer samples. The incidence of breast cancer is the same for left and right breast, thus breast cancer do not have any predilection for which hand the person uses/do not uses. The incidence for breast cancer in Fiji is lesser compared to Australia, USA and the UK incidence. The incidence of breast cancer between the iTaukei and FID are similar. This is attributed the high iTaukei population in the Central/Eastern division and the higher in the western division. Others ethnic group shows lesser incidence rate. Male rate for breast cancer is similar to international values, while female rate is lower than international values. Breast cancer is common from thirties to the sixties. Majority of breast cancer shows grade 2 cancer. Common breast cancer size ranges from 2cm to 5cm. Majority of the mastectomies with axillary clearance shows more than 3 lymph node having tumour metastasis. The information from the tumour grade, tumour size and lymph node involvement showed that people present late to hospitals for examination and investigation. There are more awareness programme for breast cancer being disseminated, thus people are coming to hospital early and the diagnosed breast cancer sizes are a lot more compared to previous years. Incomplete breast cancer reports are a serious issue detected. Missing data ranges from Age, ethnicity, site of breast cancer, Tumour size, tumour grade, lymph node involve and hormonal status

Strengths of study: This is the first study to look at the demographics of breast cancer in Fiji. The study looks at data from the whole of Fiji and all the histology breast cancer reports are being included in the study. The study can be used as a base line for future studies, the results can be used as supporting evidence to get advance medical equipment's and tests.

Limitations of study: When searching for breast cancer in CWM with the programme Microsoft access, the search parameter used under the specimen column was the word "breast" and "mastectomy". Breast specimens that were labelled with any other name apart from the above mentioned have been missed out. An example would be the breast cancer cases labelled with anterior chest wall mass will be missed out. Significant numbers of report were missing some information vital information like age, ethnicity, grades, sizes, and hormonal status. To have better coverage for breast cancer histology, samples from Suva private hospital and Autopsy sample of breast cancer are supposed to be included. Figures and comments made to the biopsy versus mastectomies are not accurate and cannot be used to make meaningful interpretations since most of the samples were excluded by the exclusion criteria. But if we were to purely look at the numbers of the biopsies and mastectomy than all those excluded samples due to repetition needs to be included.

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Original Study

BASELINE KNOWLEDGE, ATTITUDE, PRACTICE AND BARRIERS (KAPB) REGARDING LIFESTYLE RISK FACTORS FOR NON COMMUNICABLE DISEASES IN BA PROVINCE, FIJI

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ABSTRACT

Non-communicable diseases (NCDs) are the major causes of premature death and disability in Fiji, accounting for 80% of mortality in the Fijian population [1]. This is the first community-based research in Fiji on knowledge, attitude, practice and barriers (KAPB) regarding lifestyle risk factors that contribute to NCDs and the impact of health promotion activities on their KAPB. This paper reports on baseline demographics and KAPB findings. Paper 2 will report on the impact of health promotion activities on KAPB.

Methods: This is a prospective questionnaire based survey in 30 randomly selected communities located in Ba Province, Fiji, conducted between May 2016 and April 2018.

Results: There were 952 participants with mean age was 43.2years (SD=15.4) range 18 to 83; 63.4% were iTaukei, 35.8% were Fijians of Indian Descent (FID) and 0.7% 'Others' and 70% were females. There was high awareness that smoking (94.3%), alcohol abuse (82.8%), kava abuse (72.6%), high salt intake (94.3%) and physical inactivity (97.9%) were not good for health. However, in-depth **knowledge** of effects of these risk factors was low, with only around 20% having a good knowledge. For **attitude,** 52.6% disagreed and 41.4% were neutral to smoking, 89.9% disagreed with alcohol abuse, 79% disagreed with Kava abuse, 84% agreed with low salt intake, and 84.6% agreed with being physically active.
As for **practice**, 20.7%of participants were current smokers, 20.6% drank alcohol, 37.9% drank kava, 30.5% added extra salt to food, and 30.1% were physically inactive. Having good knowledge did not significantly decrease practice of smoking, alcohol or kava use. Addiction was the major reported **barrier** to cessation of smoking (60.2%), alcohol abuse (46%) and kava abuse (34.2%) whereas, 'unwilling to change' for good nutrition (51.6%) and 'laziness' for physical activity (43%).

Conclusion: The awareness of the various NCD lifestyle risk factors is high with poor in-depth knowledge of their impact on NCDs. Unfortunately having good knowledge and appropriate attitude did not translate to decreases in risky lifestyle practices.

Keywords: *Non communicable diseases, smoking, alcohol, kava, nutrition, physical activity knowledge, attitude, practice and barriers*

INTRODUCTION

Of the 15 provinces in Fiji, Ba Province is the most populous province with its 247,708 residents accounting for 28.0% of Fiji's population [2]. It comprises of the districts of Nadi, Lautoka, Ba, and Tavua, where this study was conducted. Fiji's population comprises of 56.8% iTaukei (indigenous to Fiji), 37.5% Fijian of Indian Descent (FID) and 5.7% Others [3]. Overall in Fiji about 44.1% of the population live in rural areas[2].

Non communicable diseases (NCDs) are the major causes of premature death and disability in Fiji, accounting for 80% or more of mortality [1,4]. NCDs in Fiji are thought to be contributing to a significant plateau in life

expectancy since the early 1990s [5]. The Fiji Ministry of Health and Medical Services, alongside its developmental partners, World Health Organization (WHO) and the Secretariat of the Pacific Community (SPC), have ongoing health promotion interventions in response to this trend. However recent data indicates that the prevalence of NCDs and their impact on the well-being of Fijians is at crisis level [6].The steady transition from indigenous community lifestyle traditions towards a more urban and western orientated environment continues to take its toll on this lifestyle diseases burden of NCDs [7]. The recognised lifestyle risk factors for NCDs in Fiji are smoking, alcohol abuse, kava abuse, poor nutrition and physical inactivity [1].

The Fiji national STEPs surveys in 2002 [8] and 2011 [9] indicated Diabetes Mellitus increased from 16% to 29.6% and Hypertension from 19.1% to 31% during that period. Diabetes levels increased with age and were higher amongst FID (21.2%) than iTaukei (11.5%). Overweight and obesity increased from 29.9% to 34.9% and 18% to 32% respectively. However, it is noted that the age range for 2002 survey was 15 to 64 years (with 30% of the sample in the 15 to 24 years age group) whereas for the 2011 survey the age range was 25 to 64 years, which would have affected prevalence rates. The worsening NCD trends can be reversed by lifestyle modification and targeted health interventions as shown in many neighbouring developed countries [10]. The health indicators are determined by several factors known as 'social determinants of health' [11], which include poverty, education, environment, socio economic status, gender equality and employment status. The Ba Province has some of the poorest households in Fiji with low disposable family income [12].

This research was conducted from a primary health care facility (Viseisei Sai Health Centre), in 30 randomly selected communities in the Province of Ba, from May 2016 to April 2018, as part of a community empowerment project entitled the 'Collective Community Ownership of Health and Social Issues' (CCOHSI) [13] which was funded by the European Union in the Pacific. The project was designed to enhance the capacity of these 30 communities to support sustainable improvements in defined modifiable lifestyle risk factors in health and social indicators. As part of this project a baseline survey was conducted to assess knowledge, attitude, practice and barriers (KAPB), regarding lifestyle risk factors for NCDs in the 30 randomly selected communities of Ba Province Fiji. A follow up survey was conducted after intervention which is to be reported separately.

AIM

To assess the impact of health promotional activities on KAPB regarding lifestyle risk factors for NCDs in 30 randomly selected communities in the Ba Province, Fiji Islands.

OBJECTIVES

i. To determine the baseline KAPB regarding lifestyle risk factors for NCDs from the 30 communities in Ba Province. (Results reported in this paper 1)

ii. To assess the short-term impact of health promotion activities on KAPB regarding lifestyle risk factors for NCDs. (Results reported in paper 2)

METHODOLOGY

Thirty communities from all 227 villages and settlements of Ba province were randomly selected using online software [14]. Information sessions were held in the communities and individuals were invited to participate in the survey. Informed consent was obtained for participation and trained staff administered questionnaires using standardized pre-tested questionnaires.

The questionnaires included demographics and KAPB questions pertaining to NCDs and its lifestyle factors of smoking, alcohol abuse, kava abuse, poor nutrition and physical inactivity. To gauge attitude participants were asked how they felt about a particular lifestyle practice. Likert scale was used for all attitude questions where responses were in five categories of 'strongly agree', 'agree', 'neutral', 'disagree', or 'strongly disagree' to the lifestyle practice.

The data was then captured in an excel spreadsheet; cleaned, coded and transported to SPSS version 24 statistical software for analysis. Univariate and bivariate analyses were performed; univariate analysis for frequency computations and bivariate analysis in computing associations between variables. The Chi-square test was used to test associations between categorical variables. A 5% significance level was used throughout.

Ethical approval was obtained from the College Health Research Ethics Committee of the College of Medicine, Nursing and Health Sciences, Fiji National University and the Ministry of Health Fiji.

RESULTS

Thirty communities (15 villages and 15 settlements) were engaged in the project, of which 24 were located in rural areas, one in an urban area, and five in peri-urban areas. The mean age was 43.2 years (SD=15.4) range 18 to 83 years, with 59.3% between 30 to 60 years of age. Significantly more iTaukeis were in the younger age categories up to age 49 whereas more FIDs were in the older categories of 60 and above ($p<0.001$). Seventy percent were females and 30% males (Table 1) with no significant difference in age categories by gender. The majority had undertaken some secondary education. There was a significant difference ($p<0.001$) in levels of education by age category where those aged 60 and over had more in 'no education' or just 'primary education' group. Younger age categories were more likely to have had 'secondary' or 'tertiary education'. There were a high proportion (59.3%) of participants with income less than $500 per month income with significantly more iTaukeis ($p<0.001$) in this category. There was no significant difference between iTaukeis and FIDs in the number of individuals per household categories. Almost 81% of participants were living in homes owned by their families with no significant difference between the 2 major ethnic groups. Overall 80.7% of women were unemployed and most were involved in Domestic duties. Those with higher education and professionals were more likely to be in the higher income categories.

General knowledge on NCDs

Overall general knowledge regarding NCDs was high. When asked regarding the most common cause of deaths in Fiji, 66.8% said NCDs and 10.8% said Cancer (77.7% some correct knowledge); 91.9% knew that NCDs were preventable; 89.9% were aware that lifestyle changes were required for prevention of NCDs and85.9% were aware of some of the risk factors; 37.5% of participants reported that someone in their family had died as a result of NCDs, and of those 99% said it had affected how they lived. When asked how they had made changes, 70% stated lifestyle changes and 30% emotional changes.

SMOKING KAPB

Knowledge: The majority (94.3%) of participants were aware that smoking was bad for health. When asked how smoking affected health (Figure 1), 18.5% had good knowledge ('good knowledge' was where participant chose 'all of the above' option where they were aware of several effects of the lifestyle risk factor on health) of the consequences of smoking. Thirty percent of participants thought that 1-5 cigarettes per day were good whereas 61.4% knew that no amount of cigarettes smoking was good. The majority (95%) was aware that smoking affects those around the smoker (passive smoking). When asked about the benefits of cessation of smoking (Figure 2), 20%had a good knowledge ('all of the above').

Attitude: When participants were asked how they felt about someone smoking, 19% strongly disagreed with the practice, 33.6% disagreed, 41.4% were neutral, 3.1% agreed and 2.9% strongly agreed to the practice of smoking. However, when asked how they felt about someone in the family smoking, 31.7% strongly disagreed, and 47.2% disagreed.

Table 1: Socio Demographics of Study Participants

Age Category	N	%	Gender	N	%	Education	N	%	Ethnicity	N	%
18-19	22	2.3	Males	667	29.9	Primary	275	28.9	iTaukei	604	63.4
20-29	196	20.7	Female	285	70.1	Secondary	532	55.9	FID	341	35.8
30-39	217	22.9				Tertiary	118	12.4	Others	7	0.7%
40-49	172	18.2				None	26	2.7			
50-59	172	18.2									
60-69	118	12.5									
70-79	47	5.0									
80+	3	0.3									
Income	**N**	**%**	**People per household**	**N**	**%**	**Household ownership**	**N**	**%**	**District**	**N**	**%**
0-200	312	32.9	1-5	546	59.5	Own	769	80.9	Ba	244	25.6
201-500	306	32.2	6-10	343	37.1	Rent	36	3.8	Lautoka	305	32.0
501-1000	226	23.8	11-15	31	3.4	Live with others	145	15.3	Nadi	214	22.5
1000+	70	7.4							Tavua	189	19.9
Don't know	35	3.7									
Employment	**N**	**%**	**Number of children**	**N**	**%**	**Marital status**	**N**	**%**			
Professional	41	4.3	0	180	19.0	Married	656	69.4			
Skilled worker	53	5.6	1-2	328	34.6	Single	159	16.8			
Non-skilled worker/ labourer	54	5.7	3-5	373	39.3	Separated/ divorced	35	3.7			
Self-employed	88	9.3	6-8	59	6.2	Widowed	84	8.9			
Unemployed	669	70.3	9-10	6	0.6	De-facto	11	1.2			
Student	26	2.7	10+	2	0.2						
Other	20	2.1									

Figure 1: Knowledge of the effect of smoking and alcohol abuse on health

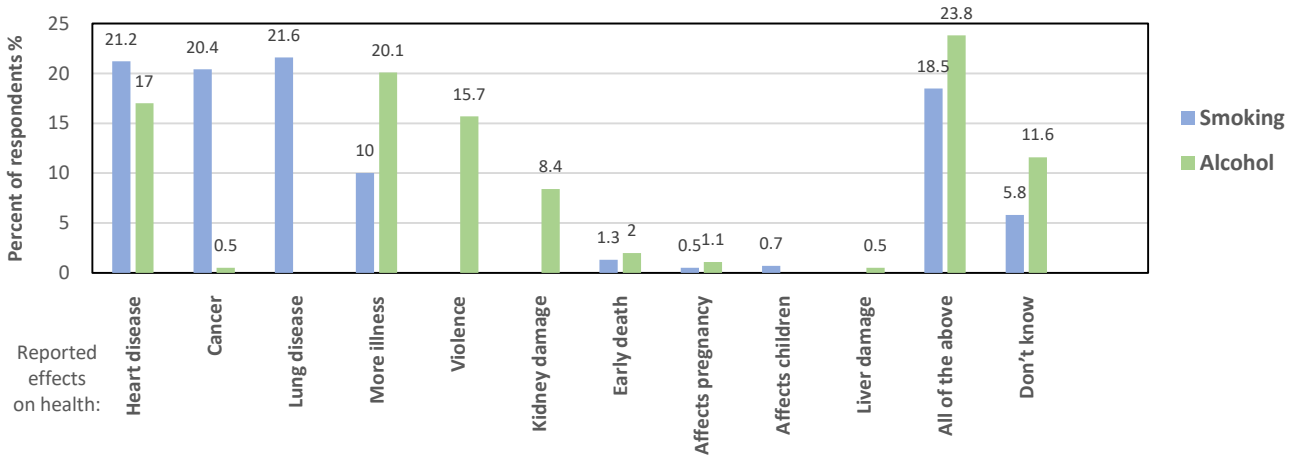
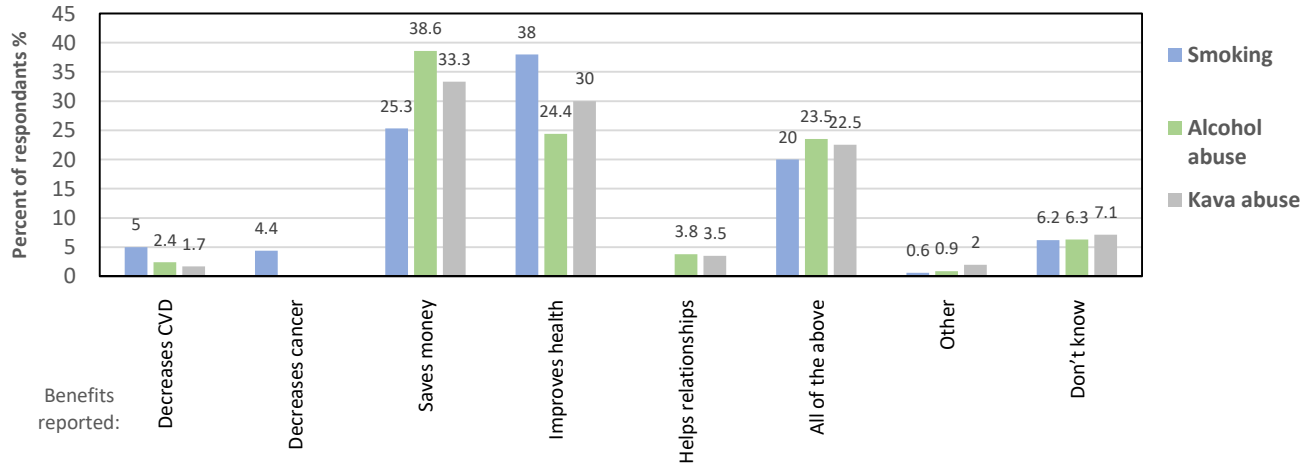


Figure 2: Knowledge of benefits of cessation of smoking, alcohol and kava



Practice: There were 20.7% current smokers (Figure 3) with significantly more males (46.3%) than females (9.6%) ($p<0.001$). Smoking was more prevalent amongst iTaukeis, with 25.7% current smokers and 11.3% in FIDs. Almost 70% of participants said someone in their family/household smoked. There was a significant difference in smoking practices by profession: skilled (47.2%) and non-skilled workers (37%) are more likely to be current smokers, compared to professionals (14.6%) and students (30.8%) ($p<0.001$).The reason for smoking given by smokers was 'peer acceptance' (50%) and 'relaxation/stress' (30.7%), 'like it' (12.2%), 'all the above' (3.5%), and 1.6% 'don't know'. The majority of smokers (60.4%) reported smoking at 'grog sessions'(groups of people sitting drinking kava often for prolonged periods of time) and 5.5% at 'alcohol sessions'; 6.3% at 'parties', 6.7% at 'work', 7.1% 'when stressed', 4.7% 'no pattern', 3.1%'all the time' and 6.3% 'don't know' or were vague about times they smoke. When stratified by ethnicity, 64% of iTaukeis and 45.5% of FIDs smoked during grog sessions. Almost 65% reported that they commenced smoking aged 19 or above; 29.8% started between the ages of 14-18 and 5.2% started below 13.

Of those who had ever smoked, 85% had attempted to stop smoking at some stage and 39% of these said they had quit. Of those who had ever tried to stop smoking, 33.2% was due to 'sickness', 'cultural/religious reasons' (12.4%), 'family' (18.8%), 'financial' (13%) and 18% were 'self-motivated to stop' and 5% 'did not know'. There was no significant difference in the age categories of those who had ever tried to stop smoking.

The majority (84.6%) of participants agreed that their community should be tobacco free and 90% thought that people should be asked to stop smoking in public places. When asked whose responsibility it was to bring about changes towards tobacco control, 55% said it was an individual's responsibility, 18% said government's responsibility and 23% said community leaders' responsibility.

Barriers: There was a significant difference in the perceived barriers to cessation of smoking amongst non-

smokers and smokers (p<0.001). The reported barriers to cessation of smoking by non-smokers versus smokers were 'addicted' (66.2% versus 60.2%); 'stress' (7.2% versus 17.6%); 'peer pressure' (1.2% versus 2.9%); 'other reasons' (3.5% versus 8.2%) and 'don't know' (21.9% versus 10.6%).

The reasons for failing in their attempts at cessation of smoking were; 'influence of grog and alcohol sessions' (26.7%), 'peer influence' (13.3%), 'after giving birth or family reasons' (15%), 'relaxation' (13.3%), 'cultural restriction lifted' (7.5%), and 'recovered from illness' (6.7%). Another 17.5% were from several other smaller categories of reason.

ALCOHOL KAPB

Knowledge: The majority of participants (82.8%) reported alcohol abuse was 'bad for them', while 10.6% reported 'small amounts was okay'. Twenty four percent had good knowledge of effect of alcohol abuse (Figure 1) and benefits of stopping alcohol abuse (Figure 2). A third (33.4%) was aware that 1 to 2 alcoholic drinks per day were acceptable, whereas 47% said no alcoholic drinks were acceptable.

Attitude: When participants were asked how they felt about alcohol abuse, 37.3% strongly disagreed with the practice, 52.6% disagreed, 4.3% were neutral, 2.5% agreed and 3.4% strongly agreed.

Practice: Figure 3shows20.6% were current alcohol drinkers of which significantly more were males (43.5%)than female (10.8%)(p<0.001).More iTaukei (25.7%) reported consuming alcohol than 11% FIDs (p<0.0001). However, there was no significant difference in alcohol consumption practices between iTaukei men (44%) and FID men (40.3%).Significantly more iTaukei women (15.9%) reported being current alcohol drinkers than FID women (3%) (p<0.001).There is a significant trend (p=0.003) of a decrease in alcohol drinking with increasing age category with 31.8% in 18-19 years, 32.8% in 20-29 years, 17.6% in30-39years, 20.7% in 40-49 years, 12.3% in 50-59years and 7.8% current drinkers in the over 60 years age groups. The majority drink alcohol at 'parties/functions' (42%),'grog sessions' (14%), 'at home' (13.6%) and 'with neighbours' (13.3%).Sixty percent drank less than once per week, 13.5% on weekends only, 17.6% 3days a week, 3.7% everyday, 4.5% on 'pay day' and 0.8% did not know. Forty percent reported drinking for 'peer acceptance' and 29.5% for 'relaxation'.

Seventy percent commenced drinking alcohol at age 19 years or above, 23.4% between 14 to 18 years, 3% aged 14 years or below. Seventy-seven percent of participants had tried to stop drinking alcohol. The main reason for trying to stop drinking alcohol was family and relationships (28.4%), health reasons (20.2%), religious or cultural reasons (15.4%) and financial reasons (14%).

Barriers: There was a significant difference in perception of barriers to cessation of alcohol abuse between non-drinkers and current drinkers (p<0.001). Barriers include 'addicted' (63.6% versus 46%); 'socially accepted' (4.9% versus 18.2%); 'stress' (8.2% versus 12.5%); 'don't know' (20.2% versus 18.8%); 'other' (31.1% versus 4.5%) as reported by non-drinkers and current drinkers respectively.

KAVA KAPB

Knowledge: The majority of participants (72.6%) said kava drinking was 'bad for them' whereas 12.3% said it was 'good for them', 10.7% were 'neutral', 0.5% said' small amounts was good' and 3.8% reported 'don't know' (Figure 3). No specific questions were asked on the direct impact of kava abuse on NCDs as there is no known direct documented evidence of it.

When asked how many bowls of kava was good to take per day; 31.9% said none; 28.7% said1 to 2 bowls, 19.7% said 2 to 5 bowls, 8.5% said 6to 10 bowls, 3.4% said 11 to 15 bowls,4.7% said 16+ bowls per day. Figure 2 shows that 33.3% said that cessation 'saves money' and 30% reported it 'improves health'.

Attitude: When asked how they felt about kava abuse 30%strongly disagreed with the practice, 49% disagreed, 14.8% were neutral and 6.1% either agreed or strongly agreed.

Practice: Thirty-eight percent were current kava drinkers (Figure 3).There was a highly significant difference by gender where 66.3% of males and 25.8% of females were kava drinkers (p<0.001).More iTaukeis (50.8%) than FIDs (15%) reported consuming kava (p<0.001)

Thirty-one percent consumed more than 21 bowls of kava per session, 26.4%said 11-20 bowls, 6% said 6 to 10 bowls and 26.4% said less than 5 bowls.

Females consumed significantly less (p<0.001) Most reported consuming kava at traditional functions (58%), 35.6% said occasionally and 6.2% everyday.

The number of hours reported spent sitting per grog session was less than 30 minutes for 14%, 1 to 2 hours for 37.2%, 3 to 5 hours for 36.3% and more than 5 hours for 12.4% of kava drinkers.

Fifty-four percent commenced drinking kava between ages 19 to 29 years, 14.1% started at 30 years or above and 13.7% at 18 or younger.

Barriers: There was a significant difference in perception of barriers to cessation of kava abuse ($p<0.001$) between those that do not drink kava and those that drink kava. Perceived barriers include 'addicted' (61.5% versus 34.2%); 'stressed' (4.8% versus 4.5%), 'cultural/tradition' (10.4% versus 21.1%), 'other' (10.4% versus 28.3%) and 'don't know' (13% versus 11.9%) respectively for kava non-drinkers and drinkers.

NUTRITION KAPB

Knowledge: Most participants (94.3%) knew that adding extra salt was bad for them. Similarly, 97.6% of participants were aware that oily and fatty food was not good for them

Attitude: When asked how they felt about salt restriction, 48.6% strongly agreed with this practice, 35.4% agreed, 3.6% were neutral, 4.7% disagreed and 6.9% strongly disagreed.

Similarly, with the attitude towards daily intake of vegetables, 47.9% strongly agreed, 46.2% agreed, 2.7% were neutral and 3.1% strongly disagreed or disagreed. Again an overwhelming 98% agreed or strongly agreed to the need to eat fruits daily.

Practice: Thirty percent reported adding extra salt to their food while eating, and of these 39.7% were iTaukei and 14.5% were FID (Figure 3).Forty-two percent reported they consumed fruit 1 to 2 days a week, 29.4% 3 to 5 days a week, 25.7% more than 5 days; 2.8% said they never eat fruit. Fifty-four percent reported they consumed 1 to 2 serves of vegetables per day, 22.6% had 3 to 5 serves and 22% had more than 5 serves while 1.1% reported none per day.

Barriers: 'People unwilling to change' was the most common (51.6%) barrier reported, followed by 'lack of knowledge' (19.7%), 'poverty' (14.4%), 'too hard' (3.2%), 'lack of access' (1.8%) and 'don't know' (9.3%).

PHYSICAL ACTIVITY KAPB

Knowledge: Ninety-eight percent said being physically active was good for them (Figure 3).Benefits of physical activity reported 'improved fitness' (67.7%), 'lowers BP' (4%), 'improves blood sugar' (1.5%). Around 22.4% had good knowledge and 4.4% 'don't know'. Sixty-two percent of participants said at least 30 minutes of exercise per session was required, 27% said 1 hour 3 to 4 days a week, and 11.2% did not know.

Attitude: Forty-eight percent strongly agreed that being physically active was good for them, 36.4% agreed, 0.8% were neutral and 14.5% either disagreed or strongly disagreed.

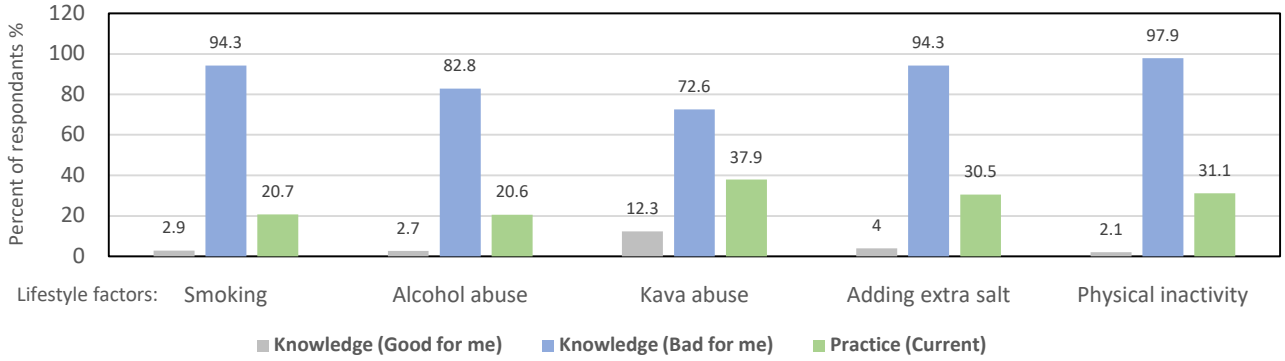
Practice: Overall 68.9% said they exercise 3 days or more per week and 31.1% were physically inactive (no exercise or less than 3 days a week) (Figure 3). Fifty-four percent reported that their daily work involved vigorous activity where they felt their heart rate increase. Exercise included walking to and from work, working in farms/gardens as well as doing some household duties that were vigorous and sustained for 30 minutes or more. Sitting and watching television was the commonest way to spend spare time during the day for 54% of participants. Over half (54.7%) of the participants reported that they had physical activity sessions for youth in their community.

Barriers: The barriers to adequate physical activity practices reported were 'laziness' (43%), 'no time' (23.8%), 'too busy with family' (13.5%), 'other' (12.5%) and 'don't know' (7.2%).

From the above KAPB information there is a consistent pattern of high levels of superficial knowledge (awareness) where the participants are aware that certain lifestyle risk factors are not good for them whereas around 20% have good knowledge of effects of the risk factor.

Table 2 above shows no significant difference in the practice of the risk factors of smoking, alcohol or kava use between those participants with good knowledge and those with less knowledge. However, there was a significant improvement in physical activity practice with

Figure 3: Basic knowledge (awareness) vs practice of lifestyle risk factors



good knowledge of the benefits of physical activity (p=0.004).

Table 2: Practice among those with good knowledge of effects of lifestyle risk factor

PRACTICE	GOOD KNOWLEDGE*		Total	P value
1. Smoking	**No**	**Yes**		
Non smoker	71.9% (539)	72.9% (137)	100% (938)	P= 0.503
Current smoker	20.4% (153)	21.8% (41)		
Previous	7.7% (58)	5.3% (10)		
2. Alcohol	**No**	**Yes**	100% (940)	P=0.132
Non Drinker	70.2% (506)	74.0% (162)		
Current	20.5% (148)	21.0% (46)		
Previous	9.3% (67)	5.0% (11)		
3. Kava	**No**	**Yes**	100% (948)	P=0.066
Non Drinker	39.3% (289)	33.3% (71)		
Current drinker	60.7% (446)	66.7% (142)		
4. Physical Activity	**No**	**Yes**	100% (950)	P= 0.004
Do not exercise at least 3 days per week	33.2% (245)	23.5% (50)		
Exercises at least 3 days per week	66.8% (492)	76.5% (163)		

*Good knowledge: Participants who had chosen the 'all of the above' option were aware of several effects of the lifestyle risk factor on health.

DISCUSSION

The awareness of the various NCD lifestyle risk factors being harmful is high but with variable in depth knowledge of their impact on NCDs as well as benefits of cessation. Approximately 20% had good knowledge of the benefits of cessation of smoking, alcohol abuse and kava abuse. When asked about the benefits of cessation of smoking and alcohol or kava abuse 23% to 38% percent of individuals said 'improves health 'or 'saves money'. Although a substantial number had awareness that health will improve however detailed understanding was lacking in many. World Bank data shows that 'the poverty rate is significantly higher in rural areas of Fiji than urban areas (38.3% relative to 29.9% in the 2013-14 survey) [16]. For the study population, in which over 65% had a household cash income below $500 a month, the benefit of saving money was important and this was verbalized in their answers. What is interesting is that those with good knowledge did not have a significantly lower practice of smoking, alcohol abuse or kava abuse (Table 2). This is consistent with the observation of Lantz et al [17] and Lindsay [18] who noted that less improvement was expected in behaviour change with provision of knowledge in unfavourable socio-economic population groups. Peoples' ability to respond to health promotion messages and improve their own health and risk factor status as a result of the messages vary significantly [19].

As far as the benefits of adequate physical activity were concerned a similar percent had good knowledge (22.4%) and once again 'improves fitness' was the stand out answer (66.7%). However, there was very poor understanding of the impact of physical activity on lowering blood pressure, risk of diabetes and lowering blood sugar levels. Despite the attitude towards lifestyle risk being promising, it did not appear to translate into a lower level of practice of risk factors.

There is an overall decreasing trend in the number of current smokers in Fiji [5,8,9,20] from 36.6% in STEPS 2002, 30.8% in STEPS 2011 and 22% in WHO's in country profile 2016 and this current study 20.7% confirms the decreasing trend. All major surveys in Fiji show that more males than females smoke as evidenced by 53% males smoked comparedto18% females (STEPS 2002) [8] and 47% males compared to 14.3% females (STEPS 2011) [9]. The WHO [4] showed prevalence of 35% amongst males and 10% in females (2016). In this study, 46.3% males and 9.6% females were reported as being current smokers. This study confirms the previously reported [8, 9] higher rates of smoking and Kava abuse amongst iTaukei men and women compared to FIDs. Unlike smoking there was not a significant difference in alcohol consumption rates in males of both the ethnicities.

The current alcohol consumers in this study was 20.6%, which is similar to the 2002 STEPS [8] survey of 23.8% but a reduction from 2011STEPSsurvey [9] of 30.8%.As more males drank alcohol than females the higher representation of females (70%) in this study would likely impact on this decrease in the overall alcohol consumption rate. A much higher percent of individuals drink kava (37.9%) compared to those who drink alcohol (20.6%) or smoked (20.7%). The overall prevalence of kava consumption in STEPS 2011 was 59%. The lower percentage in the current study would likely be due to the higher proportion of females, as 66.3% males drank compared with 25.8% females. In addition, the communities studied were predominantly rural.

There have been no studies demonstrating the effect of kava abuse on NCDs. However the influence of kava abuse on other NCD lifestyle risk factors is profound. Majority of the smokers (60.4%) in this study reported smoking at 'grog sessions' and most smokers reported the main reason for re-starting smoking was the

influence of kava and alcohol sessions. Macdonald et al [21] reported an association between kava, alcohol and tobacco was also seen in Vanuatu where most sessions of kava drinking concluded with consumption of beer and people almost always seemed to be smoking while drinking kava. Similar association was also seen in the STEPS surveys in Fiji. Kava sessions can be prolonged going on for several hours (36.3% for 3-5 hours and 12.4% for more than 5 hours)into early hours of the morning impacting on other lifestyle risk factors, such as physical inactivity due to prolonged sitting at 'grog sessions', inadequate sleep and poor nutrition. It likely promotes poor nutrition as it causes numbness of the tongue, possibly promoting addition of extra salt. Kava has been reported to be a drug with a pattern of psychoactive substance abuse that causes damage to health[21] and impacts on relationships[22].It is also noted that kava drinking was more common amongst women (25.8%) than smoking (9.6%) or alcohol consumption (10.8%).The Fiji MOHMS recommendations for drinking kava include 'no more than 3-5 mid size bowls per occasion and at least 2 kava free nights per week' [22]. Recent report by the Food and Agriculture Organisation of the United Nations and the WHO [23] suggests that there is little documented evidence of direct adverse health effects with moderate kava consumption, and that if adverse health effects have occurred, its incidence is likely to be low. Unfortunately in this study 31% of kava drinkers consumed more than 21 bowls per session, 26.4% consumed 11-20 bowls, 6% consumed 6 to 10 bowls and only 26.4% consumed less than 5 bowls. Further studies are needed to define the parameters necessary to ensure safe use of kava.

As far as knowledge of salt, fruit and vegetables, and fatty food intake was concerned there was high awareness but this was not reflected in eating habits. Interestingly, the majority of participants reported 'people unwilling to change' as the most significant barrier. FIDs generally use more salt in their cooking whereas iTaukeis tend to add extra salt after cooking.

Physical inactivity rate was higher in this study (30.1%)than the 2011 STEPS survey[9]where overall 20.8% were inactive which may be due to the higher representation of females in the cohort. More women (28.7%) than men (12.8%) were physically inactive. The WHO [4] reports similar findings of inactivity where23% females and 10% of males were inactive. WHO 'Studies in Polynesians and Micronesians' showed that diabetes was associated with physical inactivity [24], and urban dwellers were less physically active than their rural counterparts [25]. In the current study 54% of participants reported sitting and watching television as common activity to spend leisure time.

Interestingly 'addiction' was considered to be the major barrier to harmful lifestyle risk factors of smoking, alcohol and kava abuse, more so by the overall participants than by those who practice the risk factor. Yet when smokers who had tried to stop smoking and failed were asked about barriers to cessation, they did not see addiction as an issue but the 'influence of grog and alcohol sessions' as well as 'peer influence' as the main barriers. It also appears that some women stopped smoking during pregnancy but re-started after delivery. Others stopped because they were unwell or there was a traditional or cultural restriction for a period of time. Once they recovered from their illness or the restriction was lifted they went back to smoking.

LIMITATIONS OF STUDY

1. The majority of the participants in this study were from rural areas with a smaller representation from urban/peri-urban communities, which has resulted in a similar study population distribution to that of rural Fiji (64% iTaukei, 33% FID, 3% others).

2. There were more females in the sample (70%), which is likely due to the fact that females generally are better responders to health related outreach activities and also that there is a significant gender differential in the Labour Force Participation Rates i.e. 76.4% for males and 37.4% for females [2]. The survey was mostly conducted during the daytime when many males may have been at work.

CONCLUSION

There is overall awareness that lifestyle risk factors for NCDs are not good for one's health but in-depth knowledge of effects and benefits of cessation of risk behaviour is low in the 30 communities of Ba Province. This awareness however translates into appropriate negative attitude towards smoking, alcohol and kava abuse, physical inactivity and poor nutrition practices. Interestingly good knowledge and appropriate attitude did not appear to impact on practice of the risk factors. This study shows that kava drinking (grog sessions) adversely impacts on other lifestyle risk factors such as smoking, alcohol abuse, poor nutrition and physical inactivity. More research is required to gauge the harmful effects of abuse of kava in our communities. There is a need for greater health promotional activities designed for the local communities taking into consideration their specific social determinants of health.

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ORIGINAL ARTICLE

QUALITY ASSESSMENT OF COLONOSCOPY IN CWM HOSPITAL FROM 2012 TO 2016

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ABSTRACT

Introduction: Colonoscopy is the cornerstone in diagnosis and management of colorectal disease allowing direct optical diagnosis, tissue sampling for histological analysis and therapy of colonic lesions. It is a multi-step process and therefore assessment of all aspects of the procedure must be addressed. The main aim of the study is to assess the quality of colonoscopy services in the Colonial War Memorial Hospital from 1st January, 2012 to December 2016.

Methodology: A 5-year single-centre, retrospective study.

Results: A total of 341 colonoscopies were included in the study. Six Quality indicators of colonoscopy which are applicable to our setting were chosen for the study. The study showed a Cecal Intubation rate of 67% is well below the recommended rate of 90%. The bowel preparation quality is adequate in 53% of the cases compared to a recommended rate of 85%. The withdrawal time has not yet been introduced however, an average withdrawal time of above 6 minutes is recommended for a quality colonoscopy. Acquisition of biopsies in diarrhoea patients was 79% (100% tissue acquisition rate was recommended for quality of colonoscopy).

Conclusion: The quality of colonoscopy services carried out at the Colonial War Memorial Hospital has room for improvement in the parameters determining the quality of colonoscopies.

Key Words: Colonoscopy, Quality Indicators, Cecal intubation rate, Bowel preparation, Colonoscopic findings

INTRODUCTION

Colonoscopy or coloscopy is the endoscopic examination of the large bowel and the distal part of the small bowel with a colonoscope, a camera or a fiber-optic camera on a flexible tube. This is passed through the anus which allows the examination of the entire colon (120cm to 150 cm in length).

Colonoscopy is used both diagnostically and therapeutically and permits examination and treatment of the rectum, colon, and a portion of the terminal ileum. It can provide a visual diagnosis (e.g. ulceration, polyps) and grants the opportunity for biopsy or removal of suspected colorectal cancer lesions. Colonoscopy can remove polyps as small as one millimetre which once removed, can be studied with the aid of a microscope to determine if they are precancerous or not. It can take up to 15 years for a polyp to turn cancerous.

Colonoscopy is the preferred method to evaluate the colon in most adult patients with large-bowel symptoms, iron deficiency anaemia, abnormal results on radiographic studies of the colon, positive results on colorectal cancer (CRC) screening tests, post-polypectomy and post-cancer resection surveillance, and diagnosis and surveillance in inflammatory bowel disease.

Gastroenterological problems are not uncommon in the Pacific. These Pacific island countries are isolated from each geographically, and in most of these islands the gastroenterological problems are being managed by primary care physicians, general physician and surgeons. There are no specialist gastroenterologists in any of the Pacific islands apart from Australia and New Zealand. Fiji is one of the Pacific island countries which has an endoscopy facility where these special gastroenterological diagnostic procedures can be carried out.

As defined by the Centre for Medicare and Medicaid Services, quality measures are tools that help us measure or quantify health-care processes that are associated with the ability to provide high-quality health care and/or that relate to one or more quality goals for health care [9]. Quality measures can be used to maximize the effectiveness of colonoscopy by guiding consistent, high-quality practice. However, despite being the gold standard, colonoscopy is also known to be not a perfect test. From back-to-back colonoscopy studies, it is

estimated that up to 25% of polyps are missed during colonoscopy. [10]

Performance of a high-quality colonoscopy examination requires understanding and mastery of cognitive and technical skills. Quality indicators that should be met in over 98% of colonoscopies include informed documented consent, quality of bowel preparation, measured withdrawal time, and attempted endoscopic removal of pedunculated polyps and large (<2cm) sessile polyps before surgical referral [34].

An appropriate indication for colonoscopy should be determined in 100% of cases. Guidelines for indications and contraindications for colonoscopy should be used as a filter to avoid unnecessary and potentially hazardous procedures [1, 2]. Several guidelines state that ≥90% of patients undergoing colonoscopy should have a bowel preparation rated as excellent or at least adequate. The quality of bowel cleansing has been shown to impact the ability and time needed to reach the cecum and the detection of polyps, both small and large (≥ 10 mm) [3, 4]. Aronchick, et al were the first to propose a validated bowel preparation scale. This is a 5 point categorical scale, rating bowel preparation as excellent (small volume of clear liquid; > 95% of surface seen), good (large volume of clear liquid covering 5%-25% of surface; > 90% of surface see), fair (some semi-solid stool suctioned or washed away; > 90% of surface seen), poor (semi-solid stool that could not be suctioned or washed away; < 90% of surface seen) or inadequate (repeat bowel preparation necessary) [35].

In order to visualize the entire colonic mucosa, intubation of the endoscope to the cecum is mandatory. Cecal intubation is defined as introduction of tip of the colonoscope into the cecal pole, proximal of the ileocecal valve in order to have the entire cecum visualized. Although this sometimes may be challenging, there is consensus that each endoscopist should have a cecal intubation rate of ≥ 90% of all cases [11.13]. In the literature, several factors have been associated with a higher risk of incomplete colonoscopy or more difficult intubation, with female gender being the most frequently reported predictive factor. In addition, patients with advanced age or a low body mass index, or in women with a history of hysterectomy or diverticular disease, colonoscopy is reported to be more difficult and more often incomplete. Finally, poor bowel preparation and lower Endoscopist annual case volume have been reported to be associated with a higher risk of incomplete colonoscopy [14].

In 2006, Barclay et al were the first to report that colonoscopists with a mean withdrawal time of 6 minutes or more had higher detection rates of any neoplasia and advanced neoplasia. The 2006 recommendation for a 6 min withdrawal time was supported by a community-based study of 12 gastroenterologists who performed nearly 8000 procedures. [12]

Several guidelines recommend that sedation dosages as well as patient comfort scores should routinely be reported and monitored. In their position statement on quality in screening colonoscopy, the European Society of Gastrointestinal Endoscopy proposed that no more than 1% of patients should have saturation below 85% for more than 30 seconds or should require administration of a reversal agent. Patient comfort in the screening setting is important, as patients who consider screening colonoscopy as being too uncomfortable, are less likely to participate [36].

Colonoscopy is an invasive procedure that inadvertently will lead to complications in a small subset of patients. Perforation, defined as the presence of air, luminal contents or instrumentation outside the gastrointestinal tract, is the most serious complication of colonoscopy. It may result from mechanical trauma to the bowel wall, over insufflation of the colon, or as a result of a therapeutic procedure. In the literature, reported overall rates of perforation range from 0.1% to 0.6%. The perforation rate for diagnostic colonoscopies is lower than that of therapeutic interventions. The British guidelines for screening colonoscopy state a standard of < 1:1000 risk of perforation in all colonoscopies, and a < 1:500 risk of perforation in colonoscopies in which polypectomy is performed [37].

Since the inception of the endoscopy training program at the CWM Hospital in 2008, there has not been any study/ audit carried out on the quality of colonoscopy.

AIMS &

The study aims to assess the quality of colonoscopy services in CWM Hospital from 2102 to 2016

OBJECTIVES

1. To define the demographic characteristics of the patients who underwent colonoscopy
2. To assess each quality Indicator of colonoscopy. The six chosen are as follows:
    I) Proper Consenting of patients for the procedure
    II) Appropriate Indication documentation
    III) Cecal intubation rate
    IV) Bowel preparation
    V) Tissue acquisition in cases with unexplained diarrhoea
    VI) Withdrawal time
3. To determine the common Indications of Colonoscopy
4. To determine the common Colonoscopic findings

METHODOLOGY

The study is a retrospective hospital based single-centre study audit, in a five year period from January 2012 to December 2016. Ethical approval was obtained from the CHREC (FNU), FNHRERC (MOH), and CWM Hospital Medical Superintendent.

The Inclusion criteria includes any colonoscopy done on a patient who is 14 years of age or older at the time of the

procedure; all those of age under 14 years were excluded. Also excluded were all colonoscopies done by the overseas medical doctors.

The names of all the patients who underwent colonoscopy procedure during this time were extracted from the Endoscopy register books in the Endoscopy unit, and their corresponding folders containing colonoscopy reports were sought from the Records department. A total of 341 colonoscopy reports were obtained for data collection.

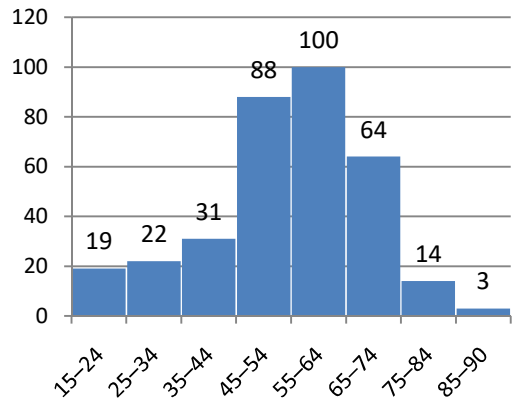
De-identification was done, and the data was entered into Microsoft Excel spreadsheet. Variables used in the collection of data include the New ID, Gender, DOB/ Age, Ethnicity, Quality of Bowel Preparation, Consenting, Appropriate Indication, Cecal Intubation, Tissue Acquisition, Indication, Colonoscopic findings and the Date of procedure. The variables were collected accordingly and the processing and analysing of data were all carried out using Microsoft Excel.

RESULTS

About 520 colonoscopies were performed by local doctors from January 2012 to December 2016. Out of the 520, only 341 colonoscopy reports were found after folders were extracted for analysis. Out of this, 206 were males while 135 were females.

Demographic characteristics of patients were by gender, ethnicity and by age group. Out of the 341, 206 (60%) were colonoscopies done on male patients while 135 (40%) were females. A total of 162 (47%) were Fijians of Indian descent (FIDs), 136 (40%) were iTaukei and 43 (12%) were others. Fifty five percent of the studied population were between the ages of 45 to 64 years, with a maximum age of 90 years, a minimum age of 15 years, and an average age of 54 years (Figure 1).

Figure 1: Population sample by age



The Primary Outcomes of the study were the Quality indicators of colonoscopy. Six most important indicators were chosen based on their importance, feasibility and applicability to our setting here in Fiji.

Proper consent documentation was achievable with 91% proper documentation; 5% of the population had their consent form poorly filled while 4% had their consent forms missing from the folders. Appropriate indication documentation was noted in 97% of the cases

Bowel preparation was adequate in 178 (52%) of the cases while 149 (44%) were Inadequate (27% satisfactory and 17% poor). Fourteen (4%) cases did not report their bowel preparation.

Table 1: Cecal intubation

	Number	%
Yes	237	70
No	88	26
Probable	11	3
Not mentioned	5	1

Cecal intubation rate was 70% with 237 cases; 88 (26%) cases did not complete for various reasons as shown by the table below (Table 1).

Table 2: Reasons for failing cecal intubation

	Number	%
Poor preparation	9	10.2
Patient discomfort	10	11.3
Excessive looping	16	18.2
Pathology encountered	9	10.2
Others	6	6.8
Not mentioned (NM)	38	43.0

Some of the reasons for failed cecal intubation were excessive looping n=16 (18%), patient discomfort n=10 (11.3%), poor bowel prep n=9 (10.2%), and pathology encountered n=9 (10.2%). However, 38 cases did not mention as to why the procedure was Incomplete (Table 2).

Withdrawal time in CWM Hospital had not been introduced therefore 0% was put down for the study.

Tissue was acquired in 27 (79%) cases of Diarrhoea, while 9 (21%) diarrhoea cases had no biopsy sent.

Secondary outcomes of the study included the common Indications for Colonoscopy and the common Colonoscopic findings.

The main common indications for colonoscopy was haematochezia n=89 (26%), abdominal pain n=57 (16.7%), altered bowel habits (ABH) n=26 (7.6%) followed by other indications (Table 3).

The most common Colonoscopic findings were diverticulosis n=51(15%), haemorrhoids n=45(13.2%), colonic tumours, polyps and suspected malignancy n=30 (8.8%), all forms of inflammatory colitis n=23 (6.7%),

followed by the rest. Ninety-six (28%) of the cases were labelled as normal scopes (Table 4).

Table 3: Indications for Colonoscopy		
	Number	%
Haematochezia	89	26.0
Abdominal pain	57	16.7
Abdominal pain + others	20	5.9
Altered bowel habits (ABH)	26	7.6
ABH + abdominal pain	9	2.6
ABH + others	20	5.9
Haematochezia + others	19	5.6
Diarrhoea	12	3.5
Diarrhoea + others	17	6.0
Anaemia	19	5.6
Melaena of UO, GIT bleeding	10	2.9
Follow up scopes	11	3.2
Others (WL, BO, Screen, post op, etc)	32	9.3

Table 4: Findings for Colonoscopy		
	Number	%
Colonic tumours/polyps/CA	30	8.8
Diverticulitis	10	2.9
Diverticulosis	51	15.0
Diverticulosis + Colonic polyps	13	3.8
Diverticulosis + Haemorrhoids	14	4.1
Haemorrhoids	45	13.2
All forms of inflammatory colitis (IBD, IC, proctitis, etc.)	23	6.7
Infectious colitis	12	3.5
Rectal tumours/ polyps/ CA / ulcers	13	3.8
Normal scopes	96	28.0
Incomplete scopes	21	6.2
Others	13	3.8

DISCUSSION

The procedure of colonoscopy in Fiji and in most of the other Pacific Islands is done on symptomatic patients as compared to the developed world whereby colonoscopy is done mostly for screening purposes to rule out colorectal malignancy. A quality colonoscopy is required to accurately diagnose and manage colorectal diseases.

Clear documentation on consent is one of the quality Indicators in Colonoscopy. The ASGE guidelines had clearly stated that proper and clear consent documentation should be met in more than 98% of the cases. Consent is defined as the voluntary agreement by a person with the functional capacity for decision making to make an informed choice about allowing an action proposed by another person to be performed on himself or herself. Informed consent is defined as a physician's legal requirement to disclose information to his or her patient and enables the patient to understand, evaluate, and authorize a specific surgical or medical intervention in which is this case is colonoscopy. Proper explanation and understanding of the risks and benefits of the procedure should be clearly stated in the consent form. This study found 91% of the cases to have been properly consented.

This study showed a significant frequency of appropriate indication for colonoscopy according to ASGE guidelines regardless of the referring physicians. About 97% of the population in the study had an appropriate indication documented.

Complete colonoscopy as evidenced by cecal intubation is considered crucial. Cecal intubation is mandatory to have an effective colonoscopy. CIRs over 90% have been accepted as the benchmark for competency in colonoscopy. In this study the CIR was 70% which is well below the recommended ASGE average, also well lower than that reported by Waye and Bashkoff [6] (95%), Church [5] (93.6%), and Rathgaber and Wick [15] (98.4%), Dafnis et al. [7] (81%) and Bowles et al. [17] (76.9%). In all of these studies, the sample sizes were much larger than in our study, and this may explain the higher CIRs observed. This view is supported in a study by Park et al, [16] where they observed that CIRs steadily increased as the volume of procedures increased. It is possible that combination of endoscopist with varying expertise, different areas of specialization (physicians vs. surgeons), as well as different volumes of procedures could reduce the mean CIR, as was also the case in the study by Bowles et al. [17]

There have been reports about a relationship between the level of sedation and cecal intubation. Hsu et al. [19] and Froehlich et al. [20] observed that deep sedation improved CIR. Patients in the study had simple sedation and was a contributing factor to a low CIR and incomplete procedures. If a patient is not adequately sedated, the procedure may be terminated prematurely because of patient's discomfort. Hence, the emphasis should be on adequate sedation and analgesia, not necessarily deep sedation.

One of the factors that predict higher CIR is the quality of bowel preparation. This was clearly demonstrated in this study where the highest CIR was observed in those patients with good bowel preparation (56%) as compared to those with satisfactory bowel preparation (28%) and poor preparation (13%). This trend was also observed in several other studies. [8, 21, 22]

In this study males were associated with high cecal intubation rate of 67% as compared to females (37%). This is in agreement with other studies where lower CIRs were observed in females [5,7,8,9,10,21,22]. One explanation for this gender difference is that females have been reported to have longer and more sharply angulated colon compared to males [23].

Another quality measure that affects adenoma detection

is the quality of the bowel preparation. An adequate colon preparation is vital to ensure complete mucosal inspection. It has been reported that only three quarter of colonoscopies have an adequate colon preparation. [29]. In the study, the bowel preparation was adequate in 52% of the cases as compared to the International benchmark of >85%. The reasons for inadequate bowel preparation are not clear. Although generally the quality of preparation was fair, this could be better with the use of other bowel preparations such as sodium sulphate tablets. [26]. Proper explanation of the procedure and use of pamphlets in different languages might also be useful in achieving better bowel preparation. A recent meta-analysis examined the results of 11 studies. [28] The preparation quality scores were grouped into three groups: high quality (excellent/good), intermediate quality (fair), and low quality (poor/insufficient). Although low-quality preparation scores were associated with a lower adenoma detection rate (ADR), intermediate preparation ADRs were not significantly different than the exams with high-quality preparations.

Withdrawal time is another quality indicator of colonoscopy which has not yet introduced in the Colonoscopy protocol of CWM hospital. It is one of the most important Quality Indicator of Colonoscopy in detection of pathologies which had put forward by the ASGE and the UK Society for Colorectal Cancer. It is the crucial time during a colonoscopy procedure where the Endoscopist or the doctor takes in examining the bowel mucosa for any pathology. Colorectal cancer (CRC) is the second most common cause of death from cancer in the US, but CRC is preventable through screening. Most CRC begins as a small growth on the lining of the colon, known as a polyp. Over a period of several years, some polyps may turn into cancer. New data presented at the ACG Annual Scientific Meeting stated that longer withdrawal times during screening colonoscopies were associated with increased adenoma (polyp) detection rates, and shorter withdrawal times are associated with increased risk for interval colon cancer. The 2006 recommendation for a 6 min withdrawal time was supported by a community-based study of 12 gastroenterologists who performed nearly 8000 procedures. [27] Therefore introduction of the withdrawal time in CWM hospital is crucial in accurately managing colorectal pathologies.

Chronic diarrhoea is one of the most common conditions presented to a gastroenterologist. It may be defined as the passage of abnormally liquid or unformed stools at an increased frequency as stool weight ≥ 200 g/day and duration is ≥ 4 weeks. It has varied aetiology like infections, inflammatory bowel disease, neoplasia, diverticular disease, endocrine-metabolic, functional, drug induced or as a side effect of radiation therapy [30]. Colonoscopy is one of the most important tools for investigation of colorectal diseases as it has been used to screen large bowel to identify early lesions in many risk groups and to investigate patients with various complains as abdominal pain, changes in bowel habits, gastrointestinal bleeding, chronic diarrhoea and abdominal masses. However, some patients with chronic diarrhoea reveal a normal colonoscopy, their biopsies may provide the information required to establish a perfect diagnosis of the main responsible cause of this diarrhoea and prescribe sufficient treatment [31].

The Royal College of pathologists documented that endoscopic biopsy should only be done in patient in the correct clinical setting with a history of persistent watery diarrhoea without blood [31], while the British Society of Gastrointestinal Endoscopy stated in their document Quality and Safety Indicators for endoscopy that biopsies should be performed in all individuals with persistent diarrhoea [32]. The study showed a tissue biopsy acquisition rate of 79% (27 of 36 cases of diarrhoea). Number of biopsies from apparent normal mucosa in patients with chronic unexplained diarrhoea is still controversial although Marshall et al. [33] suggested six biopsies from whole colon in patients with chronic diarrhoea should be sufficient.

The most common indication for colonoscopy revealed in the study was haematochezia n=89 (26%), followed by 57 cases of Abdominal pain (17%), and altered bowel habits n=26 (7.6%).

CONCLUSION

More male patients required colonoscopy in comparison to female patients. Fijians of Indian descent more often have colonoscopy than the iTaukei population. Fifty-five percent of the study population was between the ages of 44 years to 65 years with a mean age of 54 years. The most common indications for colonoscopy were haematochezia followed by abdominal pain, and then altered bowel habits. The most common diagnostic finding colonoscopically were diverticulosis followed by haemorrhoids, then colonic tumours, polyps and suspected malignancy.

In conclusion, after ten years of the Endoscopy trainings and services, the quality of colonoscopy services carried out at the Colonial War Memorial Hospital is not up to the required international standards and requires improvement.

LIMITATIONS OF THE STUDY

1. This retrospective analysis relied on data submitted by the Endoscopist, so one cannot rule out underreporting. Our sample size appears small but this is a reflection of the level of practice of colonoscopy in our setting.

2. The data of each colonoscopist were not individually assessed, but a general analysis was done to assess the overall reporting, performance and, outcome of colonoscopy in CM hospital

3. One of the main limitations of the study was the unavailability of folders that were supposed to be pulled for the study. The retrieval rate was 66%

4. Some of the folders that were retrieved did not contain colonoscopy reports hence contributed to the low retrieval rate.

RECOMMENDATIONS

Pre procedure period:

1) The consent forms need to be properly filled with all the required particulars. In addition, the risks/ complications of the procedures also need to be mentioned in the consent form

2) To conduct a study/ questionnaire on the patients who had poor bowel preparation to find out reasons that may have contributed to the high rate of poor bowel preparations in the study.

More staff nurses are required for the purpose of educating and explaining the process of accurate bowel preparation.

3) To formulate guidelines which are written in various languages mainly the two major ethic groups in Fiji i.e. FIDs and iTaukei

4) To consider introducing other bowel preparations, like Sodium sulphate tablets, as some studies suggest that its use is superior to PICO prep which is what we use in Fiji.

Intra procedure

1) To formulate guidelines on the sedations given to patients to ensure completion of the procedures

2) More trainings and practice are required by the Endoscopists to minimize the number of incomplete procedures

3) For accuracy of Intubation rate: visualization of the cecum by notation of landmarks and photo documentation of landmarks is crucial and should be present in every procedure

4) Withdrawal time: The Withdrawal time to be documented in all colonoscopies

5) Tissue Acquisition- ensure 100% tissue acquisition in all cases of diarrhoea

Post procedure

1) Ensure that all colonoscopy reports are typed, print and pasted in every patients folders

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Case Report

A RARE CASE OF POSTMENOPUSAL UTERINE INVERSION

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ABSTRACT

Uterine inversion is a rare complication of delivery, and rarer still is a non-puerperal uterine inversion. Anecdotally some gynaecologists do not come across such cases in their whole career. The following case will illustrate a case of uterine inversion and its management undertaken at Labasa Hospital.

Key Words: *Uterine Inversion*

CASE

A 57 year old iTaukei woman was referred to Labasa Hospital for a mass protruding from vagina. From patient's history, while lifting a large pot of food, she felt perineal discomfort and sensation of a mass at her vagina. At that time it was a red mass with slight blood noted. On examination, the red mass protruding from vagina appeared like a cervical/uterine polyp. The mass was non tender, non-reducible with no active bleeding noted at the time of presentation.

The patient had been postmenopausal for the three years prior to admission. There was history of post-coital bleeding or postmenopausal bleeding. The patient had three uncomplicated vaginal deliveries. She was hypertensive, with blood pressures under control using enalapril 5 mg once a day.

The initial clinical impression was of a complete utero-vaginal prolapse (procidentia). Attempting to reduce the mass was difficult. After preoperative assessment and stabilization was completed she was scheduled for a total abdominal hysterectomy with bilateral salpingo-oopherectomy.

TREATMENT

The patient had a total abdominal hysterectomy with bilateral salpingo-oopherectomy. Intra-operatively the rare diagnosis of uterine inversion was made. The endometrial cavity had inverted into and protruding through her vagina appearing like a procidentia. From the laparotomy view, a dimpled was noted at her uterine fundus. This dimple (Figure 1) represented the round ligament and fallopian tubes being pulled through the uterine cavity and through the vagina and introitus. It was the first time the author had encountered such a condition intraoperatively, and the routine hysterectomy had to be slightly modified. Multiple pedicles were taken to separate the uterus from its blood supply and ligaments, until the vagina was accessible. Then the uterus removed and bisected as shown (Figure 2). Closure of the sheath and skin was done as routine.

The patient recovered well from surgery and she was discharged on her fifth post-operative day. A review six weeks post-operative was also carried out. The histology of the excised specimens was reported as non-malignant.

DISCUSSION

Inversion of the uterus is rare and may be categorized as puerperal and non-puerperal uterine inversion. [1] One article mentions that only 150 cases of non-puerperal uterine inversion are documented from 1887 to 2006. [2]

According to Spinelli [3] uterine inversions described by severity were as follows:

- Incomplete inversion – the uterine fundus has inverted but remains within endometrial cavity without extending past the external os.

- Complete inversion – the inversion is seen to protrude through the cervix
- Prolapsed inversion – Inversion extends beyond vaginal vulva
- Total Inversion – the uterus and vagina inverts through the introitus.

The aetiology of non-puerperal inversion has been discussed in many case reports but it is still poorly understood. Most of the literature suggests that tumours like leiomyomas, endometrial carcinomas, endometrial polyps or sarcomas having a gravitational mass effect combined with any of the following [2,4,5,6,7,8,9]:

- Thin uterine wall
- Rapid growth of tumour
- Size of tumour
- Fundal location of tumour
- Dilatation of cervix because of uterine cavity distension
- Tumour attached to a thin pedicle

Authors report that uterine inversion can be a difficult entity to diagnose [6, 7, 8]. An Iranian journal gave four suggestions to increase one's clinical suspicion of an inversion. [7] Firstly, the journal suggests the absence of the uterine corpus on bimanual exam. Next, on rectal exam the fundal depression may be felt. In addition, on trans-abdominal ultrasound scan, a Y-shaped fundal indentation or depressed longitudinal groove from uterus to centre of inverted portion may be noted. However, most authors claim that the diagnosis is made during surgery. [6, 10]

A perusal of the literature shows a paucity of descriptions of surgical techniques employed to manage such cases. Saxena and colleagues described their method of treating the condition. They state that the best approach is abdominally as adequate exposure and surgical field view of tissues is better with said approach. Furthermore, the authors claim that reduction of the inversion and then excision is usually difficult to do. [6] Alternatively though, other papers describe reducing the prolapsed inversion and then attempting the hysterectomy. [2, 8, 10]

CONCLUSION

The rarity of non-puerperal uterine inversions means that most clinicians will manage the case with little or no prior experience. An adequate knowledge of the anatomy with a seasoned gynaecologist goes a long way to ensure a successful outcome. Labasa Hospital managing such a rare case adds to the repertoire of lessons and is indeed a gem for the younger doctors lucky enough to get such experience.

CONFLICTS OF INTEREST

None to declare

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Figure 1:
Intraoperative view

Dimple (Arrow) at the fundus pulling it through the cavity and through the vagina and introitus, with the round ligament and fallopian tubes

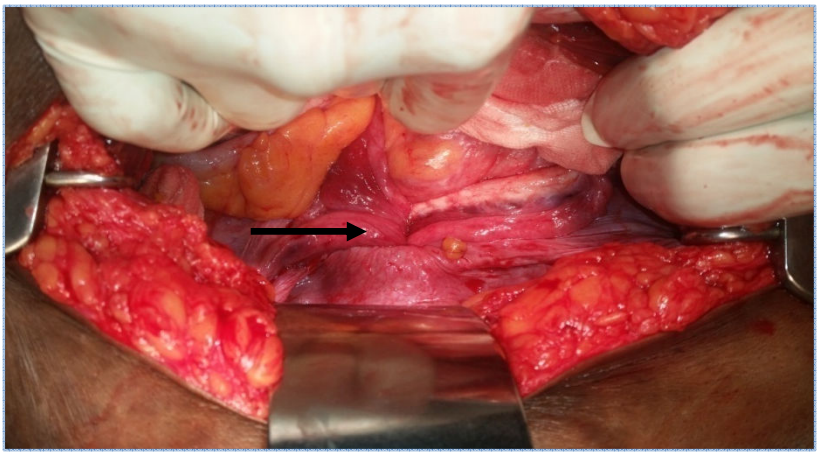
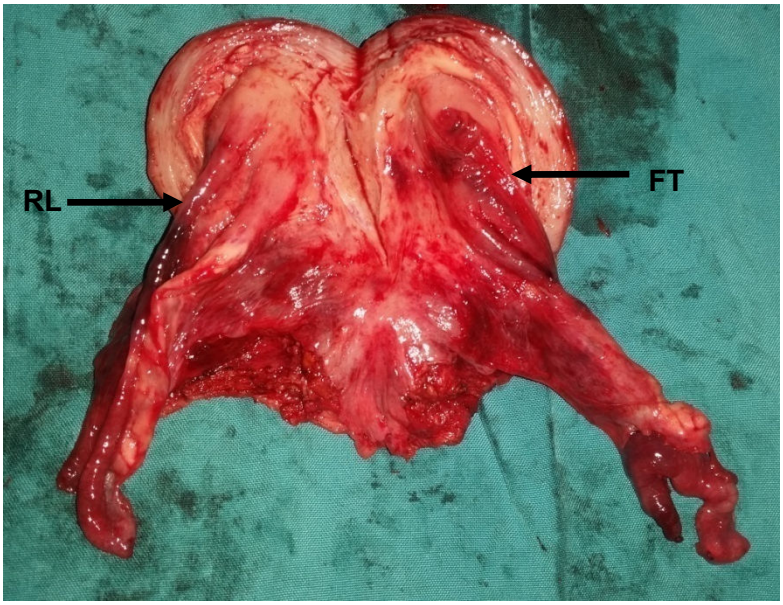


Figure 2:
Bisected Uterus

Uterus bisected anteriorly to demonstrate the round ligament and fallopian tubes which has been pulled into the uterine cavity.



Original Study

INDUCTION OF LABOUR AUDIT AT LABASA HOSPITAL – FROM DECEMBER 2017 TO JULY 2018

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ABSTRACT

Introduction
Induction of labour is carried out worldwide for a broad range of maternal and foetal indications, so as to improve pregnancy outcomes. The various methods of induction have different success rates and there is preferential use of the different modes by institutions, regions and countries. Induction of labour in Fiji is only carried out in the three divisional hospitals. This study was carried out to review the induction rate, methods used, indication and the outcomes of induction of labour in Labasa hospital.

Methods
A retrospective study of cases of induced labour at Labour ward, Labasa Hospital, Fiji, between December 1, 2017 and July 31, 2018 was carried out. This is also the first study to be done in Labasa Hospital in regards to induction of labour. Data was collated from the maternity and delivery records from the medical records department.

Results
Out of the 1436 deliveries recorded in the study period, 131 (9.1%) of patients had induction of labour. The methods of induction used included misoprostol (58.1%), syntocinon (with amniotomy) (13.7%), foleys (3.4%), misoprostol + syntocinon (12%), misoprostol + foleys (3.4%), Foleys + syntocinon (3.4%) and lastly misoprostol + foleys + syntocinon (6%). Postdatism was the commonest indication for labour at 36.8%. Seventy percent of induced parturients had successful induction of labour that led to vaginal deliveries. Misoprostol had the highest success rate at 75%. A little over half of participants, 63 (53.8%) booked in the second trimester and 21 (17.9%) participants booked late.

Conclusion
Induction of labour is a safe and effective means of expediting delivery for the benefit of either the mother or the baby. Despite discrepancies in dosages and combination of methods used by different obstetricians, the outcome generally is positive. A larger population study that includes the other two divisional hospitals would give us more feedback on induction of labour.

Key Words: *Induction of labour*

INTRODUCTION

Induction of labour is defined as the process of artificially stimulating the uterus to start labour before its spontaneous onset for the purpose of achieving vaginal delivery [2].

Augmentation is the process where the progress of labour is enhanced by artificial rupture of membranes and/or administration of an infusion of oxytocin.
Over the past several decades, the incidence of labour induction for shortening the duration of pregnancy has continued to rise [1].

Unpublished data from the WHO Global Survey on Maternal and Perinatal Health, which included 373 health-care facilities in 24 countries and nearly 300 000 deliveries, showed that 9.6% of the deliveries involved labour induction. The induction rates in developed countries are 25% higher as compared to developing countries which can have as low as 1.4% induction rate [1].

Over the years, various professional societies have recommended the use of induction of labour in circumstances in which the risks of waiting for the onset of spontaneous labour are judged by clinicians to be greater than the risks associated with shortening the

duration of pregnancy by induction [5]. These circumstances generally include gestational age of 41 completed weeks or more, prelabour rupture of amniotic membranes, hypertensive disorders, maternal medical complications, non-reassuring foetal surveillance, foetal death, foetal growth restriction, chorioamnionitis, multiple-gestation pregnancy, placenta abruption and other complications. Induction is sometimes performed for "social" or "geographic" reasons, without a medical or obstetric indication.

Induction when successful results in vaginal delivery but sometimes fails with potential risks of increased rate of operative vaginal delivery, Caesarean birth, excessive uterine activity, abnormal foetal heart rate patterns, uterine rupture, delivery of preterm infant due to incorrect estimation of dates, and possibly cord prolapse [4].

Prior to initiation of induction the woman must be assessed for its indications, contraindications to the procedure, gestational age, cervical favourability (Bishop score assessment), and assessment of the pelvis, foetal size, presentation, membrane status (intact or ruptured), and foetal well-being; documentation of discussion with the patient including indication for induction and disclosure of risk factors must be undertaken. The state of the cervix is one of the most important predictors of a successful labour induction [6]. In 1964, Bishop described a scoring system based on cervical examination that predicted vaginal delivery in multiparous women.

AIM

This study was designed to review the induction rate, methods and outcome of induced labour and its significance in obstetric practice at the maternity ward, Labasa Hospital

METHODOLOGY

This was a retrospective study of cases of induced labour at Labour ward, Labasa Hospital, Fiji, between December 1, 2017 and July 31, 2018.

Labour ward at Labasa hospital provides specialized obstetric services to parturient with both complicated and uncomplicated pregnancies. It serves as a referral centre and receives patients from the 3 subdivisional hospitals and various health centres and nursing stations from the Northern division of Fiji.

During the study period a total of 1,436 deliveries (both vaginal and caesarean sections) occurred at the hospital.

A total of 131 parturient had induction of labour during the period under review. The maternity and delivery records (patient case notes and birth/delivery registers) were retrieved from the medical records department. The induction of labour book was also reviewed. Necessary data on the socio-demographic characteristics of parturient, induction methods, indications, and outcome of induced labour was collated.

The department has an induction of labour guideline in place at labour ward, and in addition to this a specialised consent form is signed by patient before induction is commenced. However there is no set protocol on when to state that an induction method has failed (failed induction of labour), or when to add other modes of induction. Whereas when the decision is made that failure of induction has occurred, either an elective or emergency caesarean section is done.

The main outcomes measured were the proportion of women who had induction of labour, the indications for induction, and the proportion of successful and failed inductions. Conclusions were drawn by means of simple percentages.

RESULTS

A total of 1436 deliveries were recorded in the period under review, of these 131 had induction of labour, giving an induction rate of 9.1%. Since this was a retrospective study not all 131 folders were retrieved. Of the 131 inductions, 117 folders were reviewed, giving a retrieval rate of 89%.

The participants had varying levels of education as depicted in Table 1. All were booked cases and received antenatal care.

Table 1. Socio-demographic characteristics, parity and gestational age at booking (n= 117)

Variables	n	%
Age (years)		
<20	8	6.8
20 – 24	34	29.1
25 – 29	30	25.6
30 – 34	23	19.7
35 – 40	18	15.4
>40	4	3.4
Education status		
Primary	9	7.7
Secondary	62	53.0
Tertiary	46	39.3
Parity		
0	45	38.5
1 – 4	51	43.6
≥5	21	18.0
Gestational age at booking (weeks)		
<13	33	28.2
13 – 27	65	53.8
28 – 41	21	17.9

Table 2. Methods and indications for induction (n=117)		
Variables	n	%
Method		
Single methods:		
Misoprostol	68	58.1
Syntocinon (with amniotomy)	16	13.7
Foleys	4	3.4
Combined methods:		
Misoprostol + Syntocinon	14	12.0
Misoprostol + Foley	4	3.4
Foleys + Syntocinon	4	3.4
Misoprostol + Foleys + Syntocinon	7	6.0
Main Indications		
Postdate	43	36.8
Term PROM	25	21.4
Hypertensive disorders	16	13.7
Intrauterine growth restriction	13	11.1
Gestational DM	7	6.0
Decreased foetal movements	5	4.3
Intrauterine foetal death	3	2.6
Cholestasis in pregnancy	2	1.7
Others	3	2.6

Table 3. Outcome of Induction/Mode of delivery of Induced Parturient		
Variables	n	%
Method and Mode of delivery		
Misoprostol (n=68)		
Vaginal	51	75
Caesarean	17	25
Syntocinon (with Amniotomy) (n=16)		
Vaginal	11	69
Caesarean	5	31
Foleys (n=4)		
Vaginal	1	25
Caesarean	3	75
Misoprostol + Syntocinon (n=14)		
Vaginal	10	71
Caesarean	4	29
Misoprostol + Foley (n=4)		
Vaginal	2	50
Caesarean	2	50
Foleys + Syntocinon (n=4)		
Vaginal	3	75
Caesarean	1	25
Misoprostol + Foleys + Syntocinon (n=7)		
Vaginal	3	43
Caesarean	4	57

Table 4. Reasons for Failed Induction (n=26)		
Variables	N	%
Reasons for failed induction		
Misoprostol (n=17)		
Foetal distress	9	53.0
Malpresentation	2	11.8
Patient choice	2	11.8
No reason documented	2	11.8
Prolonged labour	1	5.9
Cephalopelvic disproportion	1	5.9
Syntocinon (with Amniotomy) (n=5)		
Malposition	2	40
Foetal distress	1	20
Cephalopelvic disproportion	1	20
Malpresentation	1	20
Foleys (n=3)		
Foetal distress	3	100
Misoprostol + Syntocinon (n=4)		
Obstructed labour	2	50
Arrested labour	1	25
Foetal distress	1	25
Misoprostol + Foley (n=2)		
Macrosomia	1	50
Polyhydramnios	1	50
Foleys + Syntocinon (n=1)		
Obstructed labour	1	100
Misoprostol + Foleys + Syntocinon (n=4)		
Arrested labour	2	50
Foetal distress	2	50

The gestational age at booking shows that 17.9% of parturient booked late in their pregnancy, between 28 and 42 weeks of gestation. About 28.2% booked at <13 weeks and 53.8% from 13-27 weeks. Primigravidae accounted for 38.5% of cases, 18% were grand multiparous, while others (43.6%) were Para 1–4 (Table 1)

Table 2 shows the methods used for induction of labour to include misoprostol (58.1%), syntocinon (with amniotomy) (13.7%), Foleys (3.4%), misoprostol and syntocinon (12%), misoprostol and Foleys (3.4%), Foleys and syntocinon (3.4%) and lastly misoprostol, foleys and syntocinon (6%).

The indications for induction are also shown in Table 2, where postdate was the commonest indication accounting for 36.8% of inductions.

In all cases where misoprostol was used, as per protocol of labour ward, Labasa hospital, 25 micrograms (µg) of misoprostol was given orally mixed into 25mls of water. This 'misoshake' was given every 2 hours for a maximum of 6 doses. If the patient did not start having contractions after the total of 150µg of misoprostol, a 2nd cycle would be commenced with the same dosing regimen either the next day or after one day break.

The lowest dose at which vaginal delivery was achieved was after the 3rd dose of the 1st cycle, majority delivered

vaginally before the completion or up to the completion of the 1st cycle (82.4%).

Except for one parturient who achieved vaginal delivery after the 3rd cycle, the rest who received 3 or 4 cycles failed induction and had caesarean section done.

Table 3 shows that out of all 117 inductions undertaken, 81 (69.2%) parturients had successful induction leading to vaginal birth. The rest had failed induction resulting in either elective or emergency caesarean section for various reasons, as noted in Table 4.

Misoprostol had the highest success rate of 75%, due to the smaller sample size of the other methods of induction conclusive interpretation success and failure cannot be made and a larger sample size is required

DISCUSSION

The process of induction of labour requires the intervention of a skilled birth attendant to prevent undue morbidity and mortality. The induction rate at Labasa Hospital of 9.1% is similar to the data collated by the WHO Global Survey on Maternal and Perinatal Health. A study done by Nippita et al in Australia, 2011 showed variation in induction of labour rates across the 72 hospitals in NSW with an induction rate ranging from 9.7% to 41.2% [8]. Illustrating that within the same country there can be variation in induction rates at different hospitals. The commonest indication for induction of labour in Labasa Maternity ward was postdate at 36.8%, is similar to most studies that show postdatism to be the commonest indication for induction of labour. Accurate determination of gestational age to ascertain a post date pregnancy may sometimes be an obstetric dilemma due to being unsure of the date of the last menstrual period in addition to late booking.

The commonest method of induction (misoprostol) used for cervical ripening in this study had a good success rate and an interesting finding was that the success of the 1st and 2nd cycle was found to be better than pursuing 3 or more cycles. The 25µg dosage used was in line with the World Health Organization recommendation of 25µg to 50µg. Hopefully near future the 25µg tablets that have been recently produced will be available in more developing countries such as Fiji. Larger samples of the six other modes of induction that was used should be studied for more conclusive findings to be made on their efficacy as methods of induction of labour.

Syntocinon was found to be used mostly as an augmentation method rather than as an induction method at Labasa Hospital, a major contributor could be unfavourable bishops scoring that would rule out syntocinon induction as a mode of induction. A feasible study could look at how many deliveries are augmented at Labasa Hospital and their success rates, focusing at what the bishop scores were for those that had failed. There are few studies on labour augmentation and as yet WHO has not come up with protocols regarding its implementation.

The overall successful induction rate of 69.2% in this study was close to the 75% as noted by the Mayo clinic data from USA. [9] It is important to ensure proper foetal-maternal surveillance during induction because of its significant role in the safe management of parturient with high risk pregnancies and also as way of preventing perinatal and maternal morbidity and mortality that could complicate such pregnancy and the induction procedures.

CONCLUSION

Induction of labour is beneficial and safe in high risk pregnancies when the benefits of early delivery outweigh the risk of continuation, but this is not without attendant complications and failures which can be significantly reduced with proper patient selection, good preparation, as well as adequate foetomaternal monitoring to ensure a favourable obstetric outcome of a healthy mother and baby which are the targets of the safe motherhood initiative as well as the sustainable development goals.

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ORIGINAL ARTICLE

NOTE: There has been a **revised** staging for carcinoma of the cervix uteri accepted by FIGO in 2018 *(Bhatla N ,Berek JS, Cuello Fredes M, et al . Revised FIGO staging for carcinoma of the cervix uteri. Int J Gynaecol Obstet 2019; 145:129–35. doi:10.1002/ijgo.12749*)

AUDIT OF CLINICAL STAGING OF CERVICAL CANCER AT LAUTOKA HOSPITAL: 2009 TO 2014

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ABSTRACT

Introduction: Cervical cancer is the second most common cause of cancer deaths in women in Fiji (incidence- 35/100,000) with a case fatality rate of 87%.This study aims to describe the clinical staging profile and actual management received for cervical cancer at Lautoka Hospital from 2009 to 2014. The objectives of this study are to describe the clinical staging profile for cervical cancer and compare it with recommended staging by FIGO and to describe the recommended treatments versus the actual management received following clinical staging of cervical cancer patients at Lautoka Hospital from 2009 to 2014.

Method: This is a retrospective study of the clinical records of women diagnosed with cervical cancer who underwent pretreatment clinical staging at Lautoka Hospital from 1st January 2009 to 31st December 2014. A total of 199 cases of histologically-diagnosed cervical cancer from the 1st January 2009 to 31st December 2014 were identified from the cancer registry at the Lautoka Hospital Pathology Department. One hundred and nine case folders were retrieved (55% retrieval rate). Two cases were excluded.Thus a total of 107 cases were studied.

Results: No case met the complete FIGO staging criteria at the Lautoka hospital where by a thorough pelvic examination (with or without anaesthesia), cystoscopy and imaging (IVP & CXR) were performed. Only 9% of the cases met the minimum FIGO clinical staging requirement of only having a thorough pelvic examination done. Poor and illegible documentation was a serious issue. There was incorrect FIGO stage documented in 54% of cases based on the examiners findings. Out of these cases with incorrect FIGO stage, 22% of cases had no FIGO stage documented. with examiners undecided on the actual FIGO stage for about a 24% of the cases, 19% under staged and 12 % of cases were over staged. Once stage is corrected according to documented findings, 58% are of FIGO stage 2B to 3B, and would have been appropriate for chemo-radiation abroad. A total of 67% of cases present with locally advanced and advance FIGO stages. Only 32% of cases clinically staged with FIGO stages 1A to 2A were candidates for surgery in Fiji. Of those who underwent clinical staging 60% received recommended management/treatment. Forty-four percent of women clinically staged at Lautoka Hospital received palliative care.

Conclusion: There was poor documentation of staging of cervical cancer and majority of the cases did not meet the minimum FIGO staging requirements. A large number of cases received palliative care, as Fiji does not have facilities for Radiotherapy. The low retrieval rate of 55% highlights the challenge of missing folders faced at Lautoka Hospital and was a limitation for this study.

Keywords: *Clinical staging, Cervical Cancer*

INTRODUCTION

Fiji has the highest incidence rate of cervical cancer amongst the Melanesian countries in the Pacific with about 161 new cases diagnosed annually [1]. The crude incidence rate for this disease in Fiji is 37.5 per 100,000 with a range of 27.8 to 39.5 [1,2,3]. Cervical cancer in Fiji has a high case fatality ratio of 87% therefore most women diagnosed with cervical cancer in Fiji will be dead within one year of diagnosis [2, 3]. It is also the second leading cause of cancer deaths for women between the ages of 15 to 44 in the country [1]. According to Fiji's Ministry of Health Annual Reports over the last decade cervical cancer has been the leading cause of female cancer annually except for the year 2012 and 2014 when it ranked second to breast cancer [4].

Since its discovery in the 1970's we now know that the human papillomavirus (HPV) is the most important risk factor for cervical cancer. With these mentioned

challenges and a 10% national pap smear screening coverage rate it comes as no surprise that majority of newly diagnosed cervical cancer cases that present to Lautoka Hospital are in advance stages. With a human papillomavirus (HPV) vaccination program introduced in to Fiji's Health system in 2013, its impact in reducing cervical cancer incidence will have to be evaluated in future studies.

Lautoka Hospital is one out of the three public divisional hospitals that provide tertiary level health care. It is also a teaching hospital for two medical schools and caters for the western division population of 361,180 on the main island of Viti Levu which is about 40 percent of Fiji's population [8]. Surgical managements available for cervical cancer at the Lautoka Hospital Gynaecology Unit include a cone biopsy, a simple total abdominal hysterectomy and radical hysterectomy with only pelvic node dissection. Advance cases requiring chemo radiotherapy and highly radical pelvic surgery can make use of an overseas treatment scheme provided by the Ministry of Health.

Clinical staging of cervical cancer in a resource constraint setting without a gynaecology oncology unit like Lautoka Hospital can be a challenge at times. The availability of anaesthetic man power, functioning sterilization equipment and theatre consumables are factors that influence the ability to run a theatre consistently without disruption at the Lautoka Hospital. Hence the availability to perform an examination under anaesthesia is directly influenced by these factors. The use of imaging with CT scan for clinical staging at Lautoka Hospital usually involves at most a two week long waiting list. Accurate clinical staging is an essential component in the management of cervical cancer as it determines disease prognosis and treatment option. Hence there is a need to describe the hospital's current practice in clinical staging of cervical cancer.

Apart from determining treatment option, clinical staging **using the FIGO staging classification for cervical cancer is essential in a low resource setting as it distinguishes surgically resectable disease** (10). Given Lautoka Hospitals' challenges in the availability of theatre and a skilled specialist to perform a radical hysterectomy accurate clinical staging plays an even more important role in proper resource utilization and investment.

AIMS

To describe the clinical staging profile and management received for cervical cancer at Lautoka Hospital from 2009 to 2014.

OBJECTIVES

1. To describe the clinical staging profile for cervical cancer performed at Lautoka Hospital from 2009 to 2014.
2. To describe the management following clinical staging of cervical cancer patients staged at Lautoka Hospital from 2009 to 2014.

METHODOLOGY

This is a retrospective descriptive study. Before the commencement of this study, ethical approval was obtained from the FNU ethics committees (DRC and CHREC), National Research Ethics Committee in MOH, as well as the Head of Department of Obstetrics and Gynaecology and the Medical Superintendent of the Lautoka Hospital.

The cancer registry at the Pathology Department was used to obtain the names and National Health identity number of women diagnosed with cervical cancer during the study period. This then aided in the retrieval of medical records from the records department of the hospital with the assistance of the hospital records clerk.

Each patient was de-identified with a unique study code and the information of interest was extracted using a data coding sheet attached. This information from the data coding sheet was transferred to a password-protected Microsoft Excel and analysed using the pivot table function on excel. Data collected in this study was analysed descriptively and the results was expressed in percentages and frequencies as the variables in this study are mostly categorical. As there are no previous data on staging of cervical cancer at Lautoka Hospital the data from this retrospective study will be mainly descriptive and tailored to achieving the objectives of this research.

RESULTS

A total of 199 cases of histologically-diagnosed cervical cancer from the 1st January 2009 to 31st December 2014 were identified from the Pathology Department Cancer Registry. From this 109 case notes were retrieved from the Records Department giving a 55 % retrieval rate for this study. Two cases were excluded due to coincidental finding following hysterectomy not for cervical cancer hence they did not undergo clinical staging. Therefore, a total of 107 cases of women diagnosed with cervical cancer who underwent pre-treatment clinical staging at Lautoka Hospital were included in this study.

Regarding the socio-demographic features of the cases, majority (47%) of the women in this study group are more than 50 years old and 26% of them were below the age of 40. The mean age was 49.5 years with a range of

23 to 78 years. Five cases in the study group were above the age of 69 years and only one case was younger than the age of 26 years. Majority (65%) of the women diagnosed with cervical cancer were iTaukei with 35% being Fijians of Indian Descent (FIDs). Majority (64%) of women with cervical cancer in this study group were not menopausal. Fifty one percent of women with cervical cancer were grand multiparous (have 5 or more births). Majority of the women in this study were married but 45% of the case folders did not have any documentation on patient's marital status. Forty-seven percent of the study group was unemployed however 44% of the group had no documentation of their occupational status. Majority (52%) of cases were referred from Nadi and within the Lautoka sub-division area probably because of their close proximity to Lautoka Hospital. Seventy-three percent of the women in this study have never had a cervical smear as a screening test prior to presentation and diagnosis with cervical cancer.

None of the patients had complete FIGO staging, that is, EUA with thorough pelvic examination (consisting of documentation of cervical lesion dimension, extent of vaginal & parametrial & pelvic side wall involvement), cystoscopy & imaging – Intravenous pyelogram (IVP) & Chest X-Ray (CXR). One had EUA with thorough pelvic examination, and cystoscopy, but without imaging (IVP & CXR). Ten patients had minimum FIGO staging thorough pelvic examination without EUA & Cystoscopy &Imaging (IVP & CXR). Majority of the cases (84%, n = 90) had an Examination under Anaesthesia (EUA). EUA was deemed not necessary in 6 cases as they had advanced disease and were recommended for palliative care. Out of the 17 patients not undergoing EUA, 6 had sufficient examination prior to EUA (that is advanced disease recognized), 3 were not fit for anaesthesia, 1 defaulted, 1 did not consent, and 6 had no reason documented.

In terms of shortcomings during EUA, 38% of the cases did not have the cervical lesion dimension documented, 31% of the cases did not document extent of vaginal involvement, 33% of the cases did not document if there was parametrial involvement, and 52% of the cases did not document if there was any pelvic side wall involvement. Majority (97%) of the cases did not have a cystoscopy performed during clinical staging. Only 46 % of the cases had a Chest X-ray documented on their clinical folder. Nineteen percent of the cases had an IVP documented on their clinical folder.

Overall, only 46% (n=49) had correct staging, where documentation of clinical findings and subsequent staging during examination was consistent with the FIGO Stage. Out of the 58 cases that had FIGO staging errors, 40% were due to no documentation of the actual FIGO stage following clinical staging. There was indecision of the exact FIGO stage in 27% of the cases. Under staging (19%) was slightly more common than over staging (12%). A significant number of cases (39%) had illegible documentation of clinical staging findings.

Forty-three of the clinical staging was performed by the Senior Gynaecology Consultant, 16 under senior consultant supervision, 3 by junior gynaecology consultant, 5 by gynae-oncologist, 1 under supervision by gynae-oncologist, 38 by senior registrar and 1 by junior registrar. For documentation 90 % were done by the Senior Gynaecology Registrar and the Senior Gynaecology Consultant. Table 1 shows that cases examined by the Senior Gynaecology Registrar were more likely to be under staged (21%) as compared to the Senior Gynaecology Consultant (7%) performing the examination during clinical staging. There was no significant difference in the proportion of cases over staged between the Senior Gynaecology Consultant and the Senior Gynaecology Registrar. Unsurprisingly the Gynaecology Oncologist did not commit any over or under staging error based on their documented clinical staging findings. Another significant finding was that the Senior Gynaecology Registrar had the most proportion of cases (40%) not having a FIGO stage documented.

Table 1. FIGO staging documentation error versus examiner

EXAMINER	CASES WITH ERROR		% Error
	Number with error	Total performed	
Not Documented			
Gynae-oncologist	1	5	20%
Junior Gynae Consultant	1	3	33%
Senior Gynae Consultant	6	43	14%
Senior Gynae Registrar	15	38	40%
Over Staged			
Junior Gynae Consultant	2	3	67%
Senior Gynae Consultant	3	43	7%
Senior Gynae Registrar	2	38	5%
Undecided			
Senior Gynae Consultant	11	43	26%
Senior Gynae Registrar	5	38	13%
Under Staged			
Senior Gynae Consultant	3	43	7%
Senior Gynae Registrar	8	38	21%
Invalid FIGO Stage			
Senior Gynae Consultant	1	43	2%
Grand Total	58		

Table 2 shows that 27% of the study population were recommended for overseas radiotherapy or chemo-radiation treatment however only 21% of these group actually received this treatment. Majority (82%) of the patients that were recommended for surgery received this treatment here in Fiji, of which radical hysterectomy was the most common surgical treatment received. Twenty-four percent of the cases had radical hysterectomy and pelvic node dissection for surgery. Out

of A total of 29 cases that were recommended for chemo-radiation or radiotherapy, only 11 patients were keen to go and were referred to MOH for assistance. From this 11 only 6 of them were confirmed to have received this treatment as they returned for review at Lautoka Hospital. However 5 of these cases had the referral made but there is no documented confirmation if they went abroad to receive the treatment. Forty-four percent of the women clinically staged at Lautoka Hospital for cervical cancer during the 6 year study period ended up receiving palliative care.

Table 2. Recommended Treatment versus Actual Management Received. (Highlighted In orange are recommended treatments and in white are actual treatments received by the group)

Recommended Treatment vs. Actual Management Received	No. of Patient	Percent
Group 1 - Chemo-radiation Recommended	23	21%
Management Received By Group 1		
Chemo-radiation	6	6%
Herbal Medicine	1	1%
Lost to follow up	4	4%
MOH Referral Made But Lost To Follow up	3	3%
Palliative	9	8%
Group 2 - Cone Biopsy Recommended	3	3%
Management Received By Group 2		
Cone Biopsy	2	2%
Lost to follow up	1	1%
Group 3 - Neoadjuvant Chemotherapy Recommended	1	1%
Management Received by Group 3		
Palliative	1	1%
Group 4 - Not Documented	12	11%
Management Received by Group 4		
Lost to follow up	9	8%
Palliative	3	3%
Group 5 - Palliative Care Recommended	32	30%
Management Received by Group 5		
Lost to follow up	2	2%
Palliative	30	28%
Group 6 - Radical Hysterectomy and Pelvic Node dissection Recommended	28	26%
Management Received by Group 6		
Radical Hysterectomy and Pelvic Node dissection	23	21%
Radical Hysterectomy and pelvic node dissection then referred to MOH for Radiotherapy But Lost To Follow up	1	1%
Lost to follow up	2	2%
Palliative	2	2%
Group 7 - Radiotherapy Recommended	6	6%
Management Received by Group 7		
Lost to follow up	2	2%
MOH Referral Made But Lost To Follow up	2	2%
Palliative	2	2%
Group 8 - Simple Total Abdominal Hysterectomy Recommended	2	2%
Management Received by Group 8		
Simple Total Abdominal Hysterectomy	2	2%
Total	**107**	**100%**

DISCUSSION

In this study group majority (47%) of the women are more than 50 years old and 26 % of them are below the age of 40 consistent with findings by an audit of cervical cancer management in 2013 by Sikiti [12]. The mean age of the study group was 49.5 years old with a range of 23 to 78 years. It was surprising to learn that the youngest woman diagnosed with FIGO stage 3B cervical cancer was only 23 years old further emphasizing the need to start screening for cervical cancer from the age even earlier than 26 years of age. With 5% of the women with cervical cancer in this study above the age of 69 years one would consider continuing screening beyond this age.

A significant proportion (64%) of the women was not menopausal and 51 % were grandmultipara. This would be the group one needs to target when screening for cervical cancer. It is important to note that these women would have had exposure to the health professionals during their pregnancies as well as post-delivery. Many attend Maternal Child Health Clinic for up to a year afterwards where their babies get vaccinated and followed up. It appears the opportunities to screen for cervical cancer are not taken up adequately.

Forty eight percent of these women with cervical cancer were reported to have never had a cervical smear done before, prior to diagnosis. Thirty-five percent of the cases in this study had their first cervical smear on presentation with cervical cancer. Therefore, 73 % of the women in this study group have never had a cervical smear for screening before presentation with the cancer. This comes as no surprise as Naidu et al have reported in a recent study in 2015 that 72% of women in the West have no knowledge about a Pap smear [16]. There is no pap smear screening program in Fiji; pap smears are done opportunistically. The pap smear coverage rate nationally is only about 10% [16].

As expected majority (52%) of cases were referred from the Nadi sub-division and within the Lautoka sub-division areas as majority of the women in the western division

reside between the Nadi and Ba corridor according to the last census in 2007 [8].

It was generally assumed that Lautoka Hospital followed the FIGO clinical staging for cervical cancer but this study shows that in actual fact this is not the case. The poor documentation is also contributing to assessing the adequacy of staging. No case met the complete FIGO staging requirements at the hospital where by a thorough pelvic examination (with or without anaesthesia), cystoscopy and FIGO approved imaging (IVP & CXR) was done. Cystoscopy is not readily available at Lautoka Hospital and majority of the staff are not trained in the use of a cystoscope. Even when cystoscopy is removed as a requirement for clinical staging, no case met the criteria for FIGO staging. Only one case met the criteria for clinical staging, which was performed by a visiting gynaecology oncologist. Not surprisingly 97% of the cases clinically staged at Lautoka Hospital did not have a cystoscopy done because of no or in-experience in the department to carry out this procedure.

Even if the minimum FIGO staging requirement of only a thorough pelvic examination without anaesthesia, cystoscopy and imaging (IVP & CXR) was assumed necessary 91% of the cases in this study group still did not meet the minimum FIGO clinical staging requirement. Of the 10 cases that met the minimum criteria, one had her clinical staging done by a visiting Gynaecology Oncologist, 6 were performed by a Senior Gynaecology Consultant, another 2 cases supervised by Senior Gynaecology Consultant, and 1 case performed by a Senior Gynaecology Registrar. This confirms suggestion in the literature that an experienced clinician is required for a thorough pelvic examination for FIGO Staging [14, 18]

Most (84%) of the cervical cancer cases clinically staged at Lautoka Hospital are done under anaesthesia. Of the 17 cases that did not have an examination under anaesthesia, for 6 cases it was deemed not necessary as they were mostly late stage disease. This is not a serious departure from the guidelines provided the clinicians were confident of a thorough pelvic examination without anaesthesia as highlighted by FIGO 2012 cancer report [15].

Review of the case notes of the study group showed that majority of the poor documentation of a thorough pelvic examination was related to cervical lesion dimension (62%), and pelvic side wall involvement (52%) non documentation. These are two key components in FIGO staging of cervical cancer because they determine treatment option, disease recurrence and prognosis. If there is no macroscopic cervical lesion visible for a woman with cervical cancer then a non-radical surgical treatment is more likely to be offered as recommended treatment [14, 15]. Therefore not documenting the cervical lesion dimensions can subject a patient to either over staging or under staging and in both situations we would not be providing the best care to the patient. Not documenting its involvement in clinical staging will not be helpful in predicting prognosis. A good prognosis for a cervical cancer patient clinically staged in Fiji equates to a higher likelihood of the patient either receiving surgical treatment in Fiji or receiving overseas treatment funding assistance from the Ministry of Health for radiotherapy.

As for FIGO recommended radiological imaging, 54% of the cases did not have a chest x-ray and 81% did not have an intravenous pyelogram (IVP). It is evident in this study that IVP became a less often used investigation at Lautoka Hospital into recent years of the study because of the installation of a CT scan machine at the hospital. CT scan with contrast provides a more superior imaging for pelvic side wall involvement and identification for para-aortic lymph node involvement [7, 11]. Although CT scan is not recommended by FIGO for use in clinical staging of cervical cancer, it is observed in this study that the gynaecology team at Lautoka Hospital used it for several of the cases in this study to identify para-aortic and pelvic lymph node involvement, as well as parametrium and pelvic side wall involvement, which contributes to prognosis. It has been observed in this study that reported CT scan findings of parametrial and/or pelvic side wall involvement has influenced the change of documented FIGO stages for these cases that had clinical staging for cervical cancer at Lautoka Hospital. Identification of para-aortic nodal involvement means poor prognosis thus these cases are least likely to be offered government financial assistance for overseas chemo-radiation treatment unless patients are able to afford full treatment costs on their own expenses. A reason for patients not having a CT scan was the common occurrence of breakdown of CT scan machines at either Lautoka or CWM hospital which affected waiting time or the availability of the machine during the study period. With the availability of more advanced imaging modalities like CT Scan with contrast and MRI in Fiji, its use may be considered for more accurate clinical staging as in literature. This is obviously a lot more expensive if done for every patient that undergoes clinical staging for cervical cancer hence a greater burden on the resources available in a low resource setting as Lautoka, Fiji. However if the use of CT Scan with contrast or MRI is subjected only to patients who genuinely are able to afford part or full treatment costs for overseas chemo-radiation treatment then this may be cost effective in the long run for the government given the $30,000 or more it contributes to sending one patient abroad for chemo-radiation treatment for cervical cancer.

Analysis of the documented FIGO stage against the documented clinical findings during clinical staging showed that 54% of these cases had the incorrect FIGO

stage documented. The staging was done better in 2009 when apparently all clinical staging were performed by 2 experienced senior gynaecology consultants. Once this changed in 2010 with less experienced gynaecology registrar's performing more of the clinical staging without Consultant supervision incorrect staging rates increased dramatically thus confirming the evidence in the literature [14, 18].

This study shows that each case clinically staged at Lautoka Hospital can be assigned a FIGO stage through careful interpretation of documented clinical findings, hence reducing FIGO staging errors. Majority (76%) of the clinical staging examination was carried out by a senior gynaecology consultant and a senior gynaecology registrar at Lautoka Hospital. This study also shows that even a senior gynaecology Registrar performing the clinical staging without any senior supervision is most likely to under stage.

Majority (58%) of these women clinically staged at Lautoka Hospital during this study period are of FIGO stage 2B to 3B, making them candidates for chemo-radiation therapy which is not available in Fiji. Sixty seven percent of these women with cervical cancer are of locally advanced or advanced FIGO stage. This result also confirms the evidence in the literature that most women in developing countries like Fiji, with newly diagnosed cervical cancer present in advanced stages [2,3,12].

Looking at recommended treatment and actual treatment received, Radical hysterectomy was the most common surgical treatment received for those recommended for surgery. This study also highlights that 44% of these women clinically staged ended up receiving palliative care. 29 cases [27%] were referred for chemo-radiation abroad with 21% of them confirmed to have received this treatment which is quite low. It is well known that many of our women would have not been able to afford the overseas treatment. It was also important to note that in 5 of these cases that had the referral made there was no documented confirmation if they went abroad to receive the treatment. This is an issue at Lautoka Hospital as there is usually no consistent communication from the Ministry of Health to the hospital to state that our patient's referral for overseas financial assistance has been received, approved and to which hospital they will be travelling to abroad for radiation therapy which is not available in Fiji. Even communication from some of the receiving hospitals abroad providing radiation therapy services is poor as it will be helpful to learn when our patient's referred from Lautoka Hospital will be returning following treatment abroad and whether they have received radiation therapy from an internationally credited institution. The Gynaecology Department at Lautoka Hospital has an obligation to follow up all of its patients referred for radiation therapy abroad.

CONCLUSION

There were some instances of poor documentation of clinical staging as well as assignment of a FIGO staging in the cases studied. There was also a problem with both under staging as well as over staging which has implications on management this eventual prognosis. In a low resource country such as Fiji, over worked staffs who conduct all other general obstetrics and gynaecology work for the hospital are expected to perform these highly specialized procedures. There is a need for adequate training and supervision for these health professionals as cervical cancer is common in this country. A strength of this original study is the results are consistent with the literature published around the topic. The limitations of this retrospective study is a 55% retrieval rate which highlights the challenge of missing non obstetrical folders faced at Lautoka Hospital.

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Review

SHOULD WE GIVE ANITEMETIC DRUGS TO CHILDREN IN THE EMERGENCY DEPARTMENT?

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ABSTRACT

Acute Gastroenteritis with Vomiting in children is one of the most common causes for visiting Emergency departments. Even though this is a self-limiting disease, vomiting, when it escalates, makes physicians take proactive measures such as intravenous fluid administration and eventually hospital admissions and observations to prevent worse outcomes.

Ondansetron is a potent antiemetic drug with low risks of adverse events when compared to other antiemetic medications and it is still not used widely in clinical practice.

This article examines evidence for use and compares the efficacy of antiemetic drugs in children who present to the emergency department with vomiting from Acute Gastroenteritis by reviewing two papers.

Key Words: *Antiemetics, Oral Ondansetron, Childhood Gastroenteritis and vomiting.*

BACKGROUND

Children often present to hospitals with vomiting and little is usually done for management of this symptom lest we forget to focus on the Childs dehydration status.

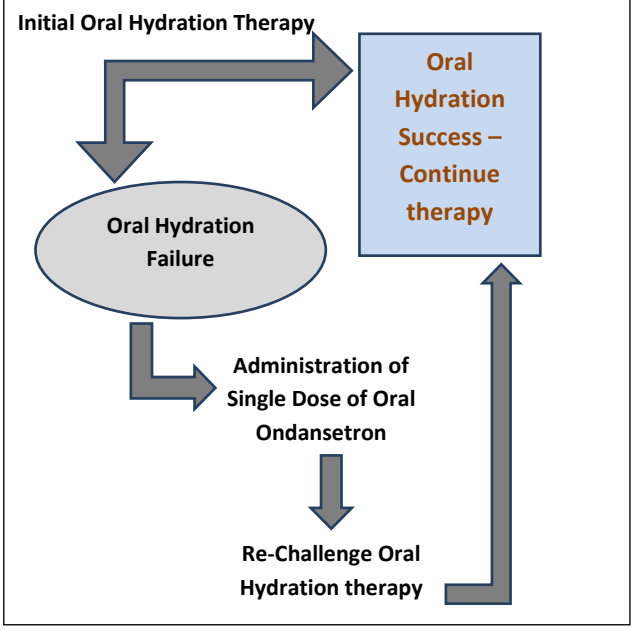
Antiemetic use is a very grey zone in clinical medicine where there is no clear direction whether use of anti-emetics should or shouldn't happen. This has always been a subject of fascination for me in my clinical practice; of why we aren't prescribing anti-emetics for children when it is out there; hence this paper looks at some evidence in regards to prescribing anti-emetics to children in the Emergency department with vomiting and non-complicated Acute Gastroenteritis.

INTRODUCTION

Acute Gastroenteritis (AGE) is an infection which is characterised by acute diarrhoea and may frequently be associated with nausea, vomiting, fever and abdominal pain[1].

AGE in children is also one of the leading causes for admission and observation in Paediatric Emergency Department (ED) units and hospitals that take away much time and medical resources whilst providing symptomatic care[2].

Figure 1. Recommendations to Consider when treating Vomiting due to non-complicated AGE



It is estimated that AGE is a leading cause of death (of about 1.3 million deaths annually) and it is one of the most common form of death in children under five years of age [3].

AGE is associated with roughly 10% of hospitalizations in the United States and close to 3.7 million visits to a medical practitioner [1, 4].

Close to 75% of children will vomit who have AGE due to an infection [5].

Marchetti et al [6] observed that vomiting is very upsetting for patients and specially their families who are helpless to do anything and therefore look up to medical professionals to provide some form of intervention.

Treatment of vomiting can be carried out using three different routes, which are oral rehydration therapy (ORT), nasogastric tube insertion or through an intravenous route of fluid administration [1].

The accepted treatment internationally for fluid replacement in children is oral rehydration therapy and this has been the mainstay of treatment endorsed by all clinical guidelines [7, 8].

The fluid loss occurring through vomiting causes a hindrance to effective oral rehydration, and this results in parents and physicians favouring intravenous fluid therapy (IVT) in patients who are not really sick enough to warrant intravenous fluid administration [8, 9].

At this juncture, because of persistent vomiting resulting in fluid replacement failure, there could easily be administration of an antiemetic drug that would result in lower levels of more invasive therapies. This could easily prevent admission of children to ED's over long periods of time and thereby reduce financial burden on healthcare systems and time saved in management of the condition [10].

Over the past few decades various *off label* antiemetic agents have been used to treat vomiting in children and its use has been controversial [11]. The use of said antiemetics is *off label*, meaning that the drugs used are meant for some other condition for which it has been licensed and not specifically for preventing emesis. Some commonly used off label drugs have been from the genera of corticosteroids, e.g. dexamethasone, dopamine receptor antagonists, e.g. domperidone and metoclopramide, and antihistamines, e.g. promethazine [10].

The newest drug Ondansetron, since its approval for use in the 1990's, is now mostly favoured in children. It was initially marketed for prevention of nausea associated with chemotherapy in cancer patients [12].

Research data suggests Ondansetron is a much safer choice when it comes to antiemetic therapy in children, and whilst it comes with numerous side effects, they are less when compared to other off label anti-emetics that are still being used in clinical practice [13].

In the European continent, Domperidone was the most widely used antiemetic; in the United States antihistamines were prominent and Ondansetron was used more frequently in Britain than compared to other countries[14].

Clearly, there are benefits to using anti-emetics in children. Yet the clinical practice guidelines still recommend supportive oral hydration without fully supporting the use of antiemetic drugs to halt vomiting [15]. With this in mind, the following two papers were evaluated because it compares the most common antiemetic drugs used widely in the modern world.

WHAT DOES THE RESEARCH SAY

The first paper *The Effect of Anti-emetics in Childhood Gastroenteritis* [15], a systematic review, looked at whether there is evidence available to use antiemetic drugs in children suffering from AGE to provide symptomatic relief in reducing vomiting, reduction in visitation plus admission to hospital, rates of intravascular hydration therapy and oral rehydration therapy tolerance.

The authors included seven papers that were extracted after conduction of searches in major databases such as PubMed, Medline, Cochrane, Embase and WHO archives. The papers in this systematic review were RCT's that looked at antihistamine (Dimenhydrinate), Dexamethasone, Metoclopramide versus Ondansetron or Placebo used as antiemetics in children aged 5 months to 12 years.

Participants were those that were mild to moderately dehydrated, failed ORT challenge and had suspected AGE. Four papers looked at oral Ondansetron with drug doses as follows:

- 8kg to 15 kg: 2mg
- 15kg to 30kg: 4mg
- > 30kg: 6mg to 8mg.

Frequency of administration was stat dose in most of the studies.

IV Ondansetron was used in 2 studies at 0.15mg/kg to 0.3mg/kg. Metoclopramide was used at 0.3mg/kg-IV-single dose. Dexamethasone dose was IV 1mg/kg to a maximum of 15mg. Dimenhydrinate was given per rectally at doses of 40mg for <15kg, 80mg for 15-25kg and 120mg for >25kg.

Six studies were conducted in an ED setup and one was in an outpatient setup.

Results showed that there was 54% reduction in incidence of vomiting with antiemetic use.

There was also a 54% reduction in hospitalizations in the antiemetic groups and its usage reduced intravascular hydration by 6O% during an emergency department observational admission. There was overall increase in oral rehydration therapy by 22% in the antiemetic groups.

The authors also highlighted that most efficacious drug was Ondansetron than compared to other classes. The findings of this study can be applied to the local management of children who have vomiting from AGE.

The authors did not look at the side effect profile of the drugs used and did not comment on those findings in detail. This would be an important consideration if such drugs were to go mainstream for treatment of vomiting in children.

In regards to the benefits of administering antiemetic in children, in the United States, administration of ondansetron would prevent 29,246 invasive intravascular insertions, prevent 7220 admissions to hospitals, and also save healthcare providers US$61.1 million annually [16]. The side effect profile of ondansetron is still lacking and authors suggest that this should be further evaluated.

In inference of their study the authors say that anti-emetics are effective in management of gastroenteritis and have the ability to decrease the morbidity and mortality in children suffering from vomiting in the above disease state.

The second study appraised was *Oral Ondansetron versus Domperidone for Acute Gastroenteritis in Paediatric Emergency Departments: Multicentre Double Blind Randomized Controlled Trial* by Marchetti *et a* [6].

This study was chosen because it compares the most efficacious drug, ondansetron that was identified in the above systematic review against the most commonly used agent, Domperidone in Europe [14].

The authors looked at children from 1 to 6 years of age who had vomiting due to AGE and the study's aim was to see whether administration of interventional oral Ondansetron or Domperidone would prevent invasive rehydration therapy when compared to placebo.

All groups were treated equally. The participants all failed the first line oral rehydration therapy and then were enrolled for this study which included second trial of oral rehydration after drug intervention.

The dosage of oral Ondansetron used was 0.15mg/kg and Domperidone was used at 0.5mg/kg. This was administered once but re-administered within 15 minutes if child vomited the initial dose.

The trial was stopped early due to closure of enrolments for participants in the study. This was because the first intervention of ORT only was so successful that researchers had difficulty in recruiting patients for randomization, and in addition the second year of study did not have the annual Rotavirus outbreak which the authors were hoping for so that more children would have presented with AGE. Therefore, overall this trial failed to achieve a power of 80 percent as the researchers were unable to enrol 180 patients in each arm of the trial. Even though the power was not met (it was just by a few participants), this study provides important data for consideration in clinical settings.

The treatment effect for the primary outcome was clear and it was found that subjects that received Ondansetron had 50% lower chance of receiving invasive hydration therapy either via nasogastric or intravascular route.

Secondary outcomes showed that hospital admission rates and subjects requiring more than six hours of observation in emergency department was lower in the Ondansetron group when compared to Domperidone and placebo groups.

Subjects on Ondansetron reduced their frequency of vomiting by more than 50% when compared to the other two arms of study. Oral rehydration therapy was better tolerated in the Ondansetron group i.e. close to 90% when compared to Domperidone and placebo groups which was 65% and 64% respectively. In addition, the Ondansetron group had lower rates of investigative laboratory tests when compared to the other two groups.

In terms of side effects, there was a little more episodes of diarrhoea in the Ondansetron group than with the other intervention groups but after 48 hours, the episodes of diarrhoea was basically the same in all groups. Readmission rates to ED were similar in all groups.

The results of this study can be applied to our local setting as evidence shows that there is better tolerance of ORT and lesser invasive procedures with a single dose of oral Ondansetron therefore our population would benefit from stat oral dose therapy.

This study did consider other important clinical outcomes. It covered side effect profile of drugs especially diarrhoea associated with Ondansetron. However the authors couldn't detect rare cardiac adverse events of Ondansetron due to the low statistical power of the study [5].

It was also pointed out that Domperidone had unimpressive results when compared with Ondansetron and showed that Domperidone was just about as similar

as placebo in terms of outcomes that was being looked at.

Overall this study showed that there could be more benefits worth the harms and costs. The authors were able to demonstrate that administration of a single dose of Ondansetron in children who continued to vomit after initial oral hydration therapy reduced the need for invasive hydration therapy, expensive laboratory tests, the discomfort of vomiting and time saved in being admitted to an emergency department.

DISCUSSION

In Fiji, from personal observations, promethazine and dexamethasone are the commonly used antiemetics in children. On rare occasions some children have been administered metoclopramide.

Promethazine is available on our Essential Medicines list (EML), is inexpensive and readily available in syrup form. It is however not recommended for use in children aged less than 2 years [4, 17] due to adverse events such as sedation, drowsiness, depression, extrapyramidal reactions, hallucinations, convulsions, tachycardia and hypotension [4, 17, 18, 19].

Dexamethasone is usually linked with antiemetic effectiveness in patients undergoing chemotherapy or recovering from anaesthesia [20]. Studies are limited in using this drug as antiemetic in children and the mechanism by which antiemetic activity exerted by this class of drug is unclear. Additionally issues concerning immune suppression, Adrenal suppression and psychiatric reactions are present with this class of medication [20, 21].

Using metoclopramide is not indicated in children as adverse effects such as fatigue, drowsiness, and extra pyramidal reactions such as dystonia, akathisia, oculogyric crisis and dyskinesia are more common. Seizures, Neuroleptic Malignant Syndrome and numerous rare adverse events have also been reported [22-26].

Ondansetron also has side effects; common are- constipation, headache, flushing, and diarrhoea; uncommon are arrhythmias, chest pain, hiccups, hypotension, oculogyric crisis, seizures; very rare are- Dizziness, QT interval prolongation and vision disorders [27]. Over the last 20 years Ondansetron has been widely studied and it has been shown to have a more favourable safety profile than compared to other antiemetic drugs used in children [28].

The above two studies discussed evidently have very relevant implications for clinical practice. Both studies were clearly able to demonstrate that administering anti-emetics to children reduces vomiting and need for expensive intravascular or nasogastric hydration therapy. Antiemetic usage also reduced hospitalization in children thereby saving monetary costs relating to investigative procedures, other healthcare resources and time.

These two studies have paved a way for local Paediatric Clinical Practice Guideline reviewers to consider recommending a single oral dose of Ondansetron as antiemetic therapy if the first line oral rehydration therapy fails. This can be useful if adopted in our ED's and secondary level hospitals where time and bed space is of essence due to high patient loads.

The warning for rare cardiac side effect of Ondansetron needs to be fully evaluated and revised as current data was evidently able to demonstrate that there hasn't been any single case of cardiac related side effects associated with a single dose of oral Ondansetron administration[29].

CONCLUSION

In conclusion the appraisal of the above two papers has demonstrated that antiemetic therapy is a reasonable and perfectly safe intervention in children with persistent vomiting who do not respond to initial oral hydration therapy. It can be further elicited that a single oral dose of Ondansetron is superior to other off label drugs currently being used to treat vomiting in children.

According to the Canadian Paediatric Society the recommended Ondansetron dosage is 0.15mg/kg in syrup format and a maximum dose of 8mg can be used. Alternatively they also recommend a weight- based oral dosing regimen as follows: 8kg to 15 kg: 2mg; 15kg to 30kg: 4mg; > 30kg: 6mg to 8mg [28].

Procuring Ondansetron may be cheaper for Fiji now as the drug patency on this medication has expired and therefore generic versions will be cheaper to acquire for Fijian EML [30].

The most common side effect of Ondansetron is diarrhoea and therefore it should not be used in children whose predominant symptom is moderate to severe diarrhoea.

These data should be used by clinical guideline decision makers to re-evaluate their stance on use of anti-emetics in children, especially in ED and consider adopting oral Ondansetron in our EML.

CONFLICT OF INTEREST

The Author declares no conflict of interest.

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