Research Article

Gynaecological Health of Women Attending Hospital in Oil City of Port Harcourt in the Niger Delta Region of Nigeria

Felix M Onyije[1, 2*], Ajuluchukwu Azubuike Ngokere[2], Aloysius Ebi Ligha[3], Godwin Ovie Avwioro[4], Osaro Mgbere[5]

[1]Department of Medical Laboratory Science, Faculty of Basic Medical Sciences, College of Health Sciences, Niger Delta University, Bayelsa State, Nigeria

[2]Department of Medical Laboratory Science, Faculty of Health Science and Technology, Nnamdi Azikiwe University, Anambra State, Nigeria

[3]Department of Human Anatomy, Faculty of Basic Medical Sciences, College of Health Sciences, Niger Delta University, Bayelsa State, Nigeria

[4]Faculty of Science, Delta State University, Delta State, Nigeria

[5]Institute of Community Health, University of Houston, Texas Medical Center, Houston, Texas, USA

[*]Corresponding author: Felix M Onyije, Department of Medical Laboratory Science, Faculty of Basic Medical Sciences, College of Health Sciences, Niger Delta University, Wilberforce Island, Bayelsa State, Nigeria

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Abstract

Introduction: Increasingly, residents of the Niger Delta region of Nigeria are reporting health impacts that they believe are linked to environmental pollutions from oil and gas activities. Hence, the objective of this study was to assess the gynaecological health of women in the Oil City of Port Harcourt in the Niger Delta Region of Nigeria.

Methods: Data used for this study (n=697) were obtained from the Rivers State University Teaching Hospital (RSUTH) in Port Harcourt, Nigeria. The

patients had partial or total hysterectomy or diagnosed of gynaecological lesion. Data obtained were subjected to both descriptive and inferential statistics using SAS 9.4 version (SAS Institute, Cary, NC, USA).

Results: The distribution of the gynaecological lesions differed significantly ($p<0.001$) by year of diagnosis, developmental stage, age category and types of lesion. Leiomyoma was the highest number of lesions identified (56.0%, n=390), followed by ovarian cyst (10.0%, n=70) and retained product of conception (8.0%, n=56). Women of age group 30-39 years and 40-49 years had the highest number of lesions during the study period with a range of 21-71% and 17-34 %, respectively.

Conclusion: The prevalence and characteristics of gynaecological lesions in our study sample point to the potential public health consequences, and strong need for creation of awareness campaigns and general health assessment in the Niger Delta region of Nigeria.

Keywords: Gynaecological Lesions; Prevalence; Leiomyoma; Niger Delta Region; Nigeria

1. Background

Gynaecological lesions are common among women of reproductive age and can be influenced by environmental and lifestyle factors [1]. It constitutes important public health challenges globally, where they cause considerable reproductive morbidity and mortality especially in developing countries [2, 3]. A study of cancer registry showed that only 1% of the literature emanated from Africa compared to 34% and 42% from Europe and Asia, respectively [4]. This is partly due to the fact that a good proportion of the population still have not sought orthodox medical care and so are not recorded. Other reasons are inadequate diagnostic facilities, limited access to care, inadequate technical manpower and infrastructure as well as quality of health record data systems. Data on gynaecological lesions in some developing countries show a prevalence of cancer of the cervix [5, 6]. Cervical carcinoma in developing countries, accounts for 80% of the estimated 231,000 deaths that occur from it annually [7]. The incidence and prevalence of other female genital lesions vary from one geographical region to another [8].

Uterine leiomyomas (commonly called fibroids) are perhaps the most common tumor affecting the health of millions of women and leading indication for hysterectomy in the world. These benign tumours may be present in about 75% of females of reproductive age, and each uterus harbours an average of 6.5 tumours. Each uterine leiomyoma is a unique clonal neoplasm [9]. The lack of awareness in the villages and cities, as well as lack of screening facilities and manpower are of major concerns [10-12]. Similarly, delayed presentation of cases, which could have been averted by early detection and prompt treatment have also been implicated in poor health outcomes. The aim of this study was to evaluate the gynaecological health burden of women in the city of Port Harcourt receiving medical care at the Rivers State University Teaching Hospital (RSUTH) in Port Harcourt, Nigeria.

2. Materials and Methods

2.1 Study area

RSUTH formerly Braithwaite Memorial Specialist Hospital (BMSH) was established in 1925. It is a government owned hospital, named after a British doctor Eldred Curwen Braithwaite. It is located in the

old Government Reserved Area (Old GRA) in Port Harcourt, Rivers State, Nigeria. The hospital initially served as a medical facility for senior civil servants, later became a General Hospital and presently is a major University Teaching Hospital with the mandate to deliver comprehensive and integrated health care services to the metropolitan city of Port Harcourt and the surrounding oil producing rural areas of Rivers State and the Niger Delta region of Nigeria.

Rivers State is one of the six states that make up the South-South geopolitical zone of Nigeria. Rivers State lies at latitude 4°45' north and longitude 6°50' east and covers an area of 10,432.3 square kilometres. As of 2010, it has a population of 5,198,716 million with a density of 468 people per square kilometre and represents 3.7% of Nigeria's total population. Port Harcourt is the capital of Rivers State and one of Nigeria's leading industrial centres. The city lies at latitude 4°47'21" north and longitude 6°59'55" east, with a population of 1,382,592 million. The natives of Rivers State are mainly farmers and fishermen, and they speak more than 23 languages. The State is known as the treasure base of Nigeria due to its abundant oil and gas resources. Oil explorations in Rivers State began in 1956 and since then, there has been a paradigm shift in the occupation and lifestyle of the natives resulting from environmental pollution and industrialization. There is very little data quantifying the oil's impact on the health of people whose property, crops and livestock, drinking water, and air are polluted by oil, waste products from exploration and extraction, and extensive gas flaring.

2.2 Data source and participants

A total of six hundred and ninety-seven (n=697) records were obtained from the archives of Histopathology Laboratory of the RSUTH, Port Harcourt, Rivers State, Nigeria. The data were generated from patients who had partial or total hysterectomy or diagnosed of gynaecological lesion between 2010 and 2014. The following data were extracted from the records; age, type of lesion (adenocarcinoma, adenoma, adenomyosis, cervical polyp, chronic endomeritis, cervical intraepithelial neoplasia (CIN), condyloma acuminatum, endometrial hyperplasia, endometrial polyp, leiomyoma, ovarian cyst, ovarian cyst, retained products of conception, squamous cell carcinoma. Other minor lesions identified and classified under "others" in our study include the following: Basal cell epithelioma, Brenner tumour. cervical cyst, chronic endocervitis, chronic vulvitis, endometrial carcinoma, epidermal cyst, fibroma, haemangioma, ovaritis, vulva cyst, vulva warts, vulvaritis and yolk sac tumour (Hepatoid variant). These lesions occurred very rarely and therefore were grouped for statistical convenience) and the origin of the tissues.

2.3 Statistical analysis

Data obtained from this study were subjected to both descriptive and inferential statistics. All tests performed were two-tailed, with a probability value of 0.05 used as the statistical significance level. All statistical analyses were conducted using SAS 9.4 version (SAS Institute, Cary, NC, USA).

3. Results

Table 1 shows the distribution of gynaecological lesions and histopathological characteristics of patients by year of diagnosis. Out of the 697 lesions reported from 2010-2014, 186 (26.7%) lesions were recorded in 2013, while in 2014 it was only 46 (6.6%) lesions that were reported. There was significant difference ($p<0.0001$) in the distribution of the lesions across the years. The mean ± SD age of

women with gynaecological lesions was 39.1 ± 12.8 years, with age group 30-39 years recording the highest number of lesions (263; 39.5%), this was followed by age group 40-49 years (148; 22.3%). There was significant difference (p<0.0001) when the age groups were compared.

Table 2 shows the association between gynaecological and histopathological characteristics of patients by year of diagnosis. Age groups 30-39 and 40-49 years recorded the highest number of lesions from 2010 to 2014 with a range of 21-71% and 17-34%, respectively. Figure 1 show leiomyoma, muscle, endometrium, postmenarchal, and age group 30-39 years were denser when compared to other interactions. The highest recorded lesion was leiomyoma 390 (56.0%), followed by ovarian cyst 70 (10.0%), and retained product of conception 56 (8.0%). They were significantly different (p<0.0001) when compared. However, the lesions of the muscle origin (456; 65.5%) were more than the lesions of the epithelia (165; 23.7%) and sex cord origins (71; 10.2%) (p<0.0001). The most predominate site of occurrence of lesion was the endometrium (526, 75.5%), followed by ovary (80, 11.5%) and cervix (75, 10.8%). The various tissue origins were significantly (p<0.0001) different when compared to each other (Table 1).

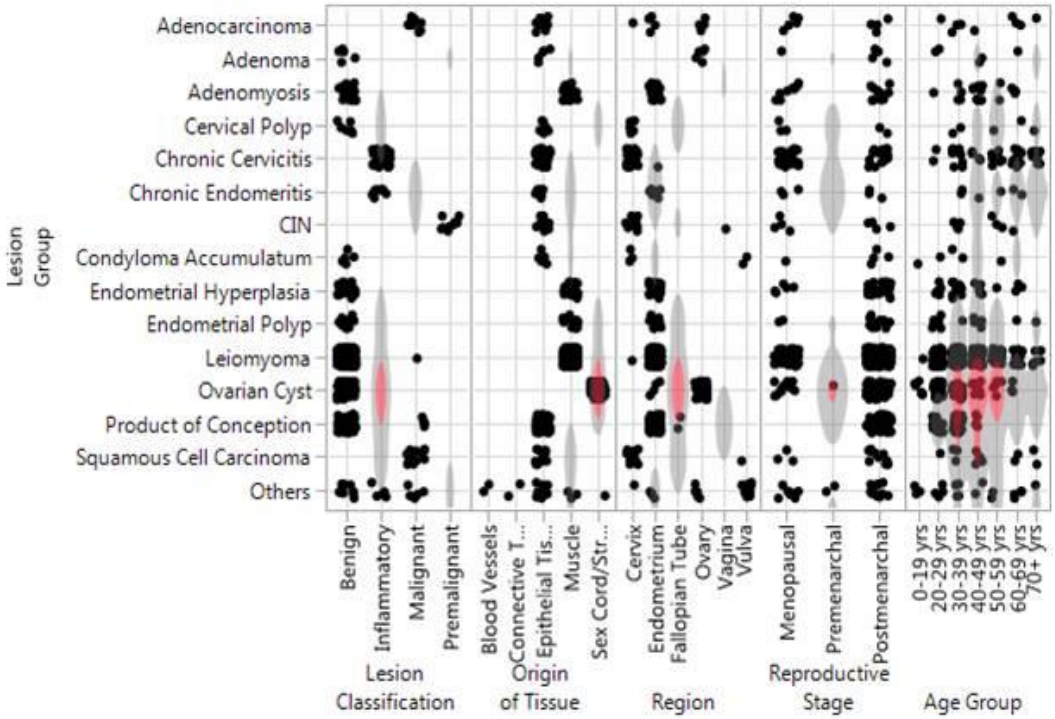

Figure 1: Scatterplot Matrix of Lesion Group by Lesion Classification, Origin of Tissue, Region of Diagnosis, Reproductive Stage and Age Category of patients.

Characteristic	N	Percent (%)	Test Statistics	
			$\chi 2$ Value (df)	P-value
Year				
2010	157	22.5		
2011	150	21.5		
2012	158	22.7		
2013	186	26.7		
2014	46	6.6	83.7 (4)	0.0001****
Developmental Stage				
Infant	2	0.3		
Teenager	5	0.8		
Adult	658	98.9	1288.4 (2)	0.0001****
Age Category (Years)				
0-19	12	1.8		
20-29	124	18.6		
30-39	263	39.5		
40-49	148	22.3		
50-59	46	6.9		
60-69	51	7.7		
70+	21	3.2	511.3 (6)	0.0001****
Mean ± SD	39.1 ± 12.8			
Lesion				
Adenocarcinoma	9	1.3		
Adenoma	5	0.7		
Adenomyosis	21	3		
Cervical Polyp	6	0.9		
Chronic Cervicitis	44	6.3		
Chronic Endomeritis	7	1		
CIN	9	1.3		
Condyloma Accumulatum	5	0.7		
Endometrial Hyperplasia	28	4		
Endometrial Polyp	14	2		
Leiomyoma	390	56		
Ovarian Cyst	70	10		
Retained product of Conception	56	8		
Squamous Cell Carcinoma	13	1.9		
Others	20	2.9	2840.1 (14)	0.0001****
Origin of Tissue				
Blood Vessels	2	0.3		
Connective Tissue	2	0.3		

Epithelial Tissue	165	23.7		
Muscle	456	65.5		
Sex Cord/Stroma	71	10.2	1029.6 (4)	0.0001****
Region				
Cervix	75	10.8		
Endometrium	526	75.5		
Fallopian Tube	2	0.3		
Ovary	80	11.5		
Vagina	1	0.1		
Vulva	13	1.9	1789.7 (5)	0.0001****

Note: The percentages may not add up to 100 due to rounding; SD=Standard Deviation

**** Significant at p<0.0001

Table 1: Distribution of Gynaecological and Histopathological Characteristics of Patients.

Characteristic	N	Year					Test Statistics	
		2010	2011	2012	2013	2014	χ2 Value (df)	P-value
		n (%)	n (%)	n (%)	n (%)	n (%)		
Developmental Stage								
Infant	2 (0.3)	2 (1.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)		
Teenager	5 (0.8)	1 (0.7)	3 (2.2)	0 (0.0)	0 (0.0)	1 (2.2)		
Adult	658 (98.9)	150 (98.0)	135 (97.8)	147 (100)	181 (100)	45 (97.8)	14.2 (8)	0.077ns
Age Category								
0-19 yrs	12 (1.8)	4 (2.6)	4 (2.9)	2 (1.4)	1 (0.6)	1 (2.2)		
20-29 yrs	124 (18.6)	21 (13.7)	38 (27.5)	29 (19.7)	33 (18.2)	3 (6.5)		
30-39 yrs	263 (39.5)	71 (46.4)	42 (30.4)	55 (37.4)	74 (40.9)	21 (45.7)		
40-49 yrs	148 (22.3)	34 (22.2)	28 (20.3)	33 (22.4)	36 (19.9)	17 (37.0)		
50-59 yrs	46 (6.9)	4 (2.6)	6 (4.3)	14 (9.5)	20 (11.0)	2 (4.3)		
60-69 yrs	51 (7.7)	15 (9.8)	15 (10.9)	9 (6.1)	10 (5.5)	2 (4.3)		
70+ yrs	21 (3.2)	4 (4.6)	5 (3.6)	5 (3.4)	7 (3.9)	0 (0.0)	44.10 (24)	0.007**
Lesion								
Adenocarcinoma	9 (1.3)	3 (1.9)	1 (0.7)	3 (1.9)	1 (0.5)	1 (2.2)		
Adenoma	5 (0.7)	2 (1.3)	2 (1.3)	1 (0.6)	0 (0.0)	0 (0.0)		
Adenomyosis	21 (3.0)	7 (4.5)	3 (2.0)	3 (1.9)	7 (3.8)	1 (2.2)		
Cervical Polyp	6 (0.9)	3 (1.9)	2 (1.3)	1 (0.6)	0 (0.0)	0 (0.0)		
Chronic Cervicitis	44 (6.3)	10 (6.4)	11 (7.3)	12 (7.6)	8 (4.3)	3 (6.5)		
Chronic Endomeritis	7 (1.0)	4 (2.5)	3 (2.0)	0 (0.0)	0 (0.0)	0 (0.0)		
CIN	9 (1.3)	1 (0.6)	6 (4.0)	0 (0.0)	2 (1.1)	0 (0.0)		

Condyloma Accumulatum	5 (0.7)	0 (0.0)	3 (2.0)	1 (0.6)	1 (0.5)	0 (0.0)		
Endometrial Hyperplasia	28 (4.0)	15 (9.6)	9 (6.0)	3 (1.9)	1 (0.5)	0 (0.0)		
Endometrial Polyp	14 (2.0)	4 (2.5)	4 (2.7)	3 (1.9)	3 (1.6)	0 (0.0)		
Leiomyoma	390 (56.0)	74 (47.1)	66 (44.0)	99 (62.7)	119 (64.0)	32 (69.6)		
Ovarian Cyst	70 (10.0)	5 (3.2)	16 (10.7)	17 (10.8)	24 (12.9)	8 (17.4)		
Retained Product of Conception	56 (8.0)	14 (8.9)	16 (10.7)	11 (7.0)	14 (7.5)	1 (2.2)		
Squamous Cell Carcinoma	13 (1.9)	5 (3.2)	4 (2.7)	1 (0.6)	3 (1.6)	0 (0.0)		0.0001****
Others	20 (2.9)	10 (6.4	4 (2.7)	3 (1.9)	3 (1.6)	0 (0.0)	104.73 (56)	
Origin of Tissue								
Blood Vessels	2 (0.3)	2 (1.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)		
Connective Tissue	2 (0.3)	1 (0.6)	0 (0.0)	1 (0.6)	0 (0.0)	0 (0.0)		
Epithelial Tissue	165 (23.7)	46 (29.3)	51 (34.2)	32 (20.3)	31 (16.7)	5 (10.9)		
Muscle	456 (65.5)	102 (65.0)	82 (55.0)	108 (68.4)	131 (70.4)	33 (71.7)		
Sex cord/stroma	71 (10.2)	6 (3.8)	16 (10.7)	17 (23.9)	24 (12.9)	8 (17.4)	39.87 (16)	0.001***
Region								
Cervix	75 (10.8)	17 (10.8)	25 (16.7)	14 (8.9)	15 (8.1)	4 (8.7)		
Endometrium	526 (75.5)	121 (77.1)	101 (67.3)	120 (75.9)	150 (80.6)	34 (73.9)		
Fallopian Tube	2 (0.3)	1 (0.6)	0 (0.0)	1 (0.6)	0 (0.0)	0 (0.0)		
Ovary	80 (11.5)	12 (7.6)	20 (13.3)	20 (12.7)	20 (10.8)	8 (17.4)		
Vagina	1 (0.1)	0 (0.0)	1 (6.7)	0 (0.0)	0 (0.0)	0 (0.0)		
Vulva	13 (1.9)	6 (3.8)	3 (2.0)	3 (1.9)	1 (0.5)	0 (0.0)	24.95 (20)	0.204 ns

Note: The percentages may not add up to 100 due to rounding; Significance level: *=p<0.05; **=p<0.01; ***=p<0.001; p<0.0001; ns= Not Significant (p>0.05).

Table 2: Association between Gynaecological and Histopathological Characteristics of Patients by Year of Diagnosis.

4. Discussion

Leiomyoma was the most frequently occurring lesion, followed by ovarian cyst and retained product of conception and the prevalence rates were significantly different when compared. The number of lesions diagnosed across the years under study were comparatively stable except for the year 2014, which was reported to have the lowest number of lesions. The fairly stable prevalence of lesions reported in our study is at variance with an earlier work on cervical cancer in Port Harcourt where a fluctuating outcome was reported from 2007 to 2010 [13]. Majority of the gynaecological lesions occurred in adults within the age category 30-39 years. Most

gynaecological lesions occur within reproductive age and may be multifactorial. This agrees with the research work of You *et al.* [14] who reported that gynaecological lesions in children and adolescents are rare compared to adults. Nwachokor and Forae [15] reported a peak age range of non-neoplastic cervical lesions in Warri, Nigeria as 40-49 years accounting for 33.7% of the total cases. Okeke *et al*. [16] in Enugu, Nigeria, reported a peak age category of 51-60 years for female genital malignancies. They observed that the late presentation might be due to low awareness, perception to seek for medical advice, lack of health care providers and policy makers, absence or poor quality of screening programs, limited access to health care services, and lack of functional referral systems [9].

Forae and Aligbe [17] reported that endometrial lesions are ranked among the most common gynaecological disorders that affect women globally, cutting across all ages and contributing significantly to increased maternal morbidity and mortality. In the present study, the endometrium was seen as the site most prone to lesions, followed by the ovary and the cervix. The high prevalence of the lesions on the endomentrium may be attributed to several causes including exogenous estrogen without progesterone [18], defective immune response [19], retrograde menstruation, apoptosis suppression and alteration of endometrial cell fate, familial aggregation amongst others [20]. Zanotti [21] reported that endometrial cancer is the most common of the gynaecologic malignancies. She further added that approximately 2% to 3% of women in the United States will develop cancer of the endometrium at some point during their lives. The result of this research also agrees with that of Nnamdi *et al*. [22] who recorded 11.4% and 0.3% for the ovary and vagina, respectively.

On year-to-year basis, the endometrium was also the most affected site. This is not in line with the findings in Sokoto by Nnamdi *et al*. [22], where 69% of the lesions were seen in the cervix. Our result for the vagina is also similar to the research on the pathology of vagina cancers by Seleye-Fubara*et al*. [23] where 0.63% was reported. In Enugu, Okeke *et al. [16]* reported no lesion on the vagina. Most of the lesions (66.0%) in this research originated from muscle tissue and 23% originated from epithelial tissue. Sex cord stroma lesions were 10.4% while the least were lesions from the connective tissue (0.3%) and blood vessel (0.3%) origins. These results did not agree with those of Sanni *et al.* [24] who reported lesions of epithelia origin (61.2%) as the highest in malignancies and the least were tissues of sex cord/stroma origin (16.1%). There was disparity in the region of occurrence based on age, as the youngest and oldest age groups were not endometrial predominant. Ovarian cyst (58.3%) was prevalent among age category 0-19 years, while in the oldest group (70 and above years) the lesions of the cervix were more prevalent (54.1%). The other groups: age 20-29, 30-39, 40-49, 50-59 and 60-69 years all recorded high prevalence in endometrium being 71.8%, 83.3%, 86.5%, 60.9% and 54.9%, respectively. Typically, ovarian cysts are frequently seen in young females due to failure of ovulation. However, fewer cases could also be seen in older women, studies have shown that 90% of these cysts are resolved spontaneously [25].

Leiomyoma, which is uterine fibroid, is the most common lesion in this research with 390 cases representing 56.0%. The prevalence of leiomyoma was on the increase from 2011 to 2014. This is similar to the finding of Mohammed *et al.* [26] where leiomyoma (52.6%) was the highest among 19

lesions identified in Zaria. In Gombe, Nigeria, 54% of operative findings were fibroid [27]. In eastern part of Nigeria, it was lower with 25.9% [6] when compared with the results from the north and the present research, though the highest among other lesions. The findings of our study is also in line with the work of Nnoli *et al*. [28], where the researchers reported that 1 in every 5 women of child bearing age of over 30 years had fibroids. Similarly, 20-30% of women of this age was reported as harboring uterine fibroids, thus accounting for 3.2 –7.6% of new gynaecological cases and 68.1% of hysterectomies [29]. On the other hand, ovarian cyst (10.0%), which was the second highest reported lesion in our study, did not agree with the finding of Ikechebelu [30] in Nnewi, where 0.67% was reported as the prevalence of ovarian cyst.

Retained products of conception which is the 3rd most prevalent lesion in this study are associated with complication of labour and delivery. The retained tissue can cause prolonged postpartum haemorrhage and endometritis. The usual treatment is curettage, which results in further complications in 7% of patients, including uterine perforation, cervical laceration, and subsequent synechia formation. Retained products of conception are suspected when routine examination of the placenta at delivery reveals an incomplete placenta or when a patient has signs of endometritis or prolonged vaginal bleeding in the postpartum period [31]. In most centres, it is a routine practice to submit tissues obtained by uterine evacuation for histopathologic examination to confirm the presence of intrauterine fetal tissue. The main rationale is to detect an ectopic pregnancy, which requires immediate further management, or a molar pregnancy, which necessitates special follow up. Other reasons include detecting surgical complications, such as incomplete or failed pregnancy evacuation; determining the cause of recurrent pregnancy loss; or detecting unexpected fetal pathology [32]. Retained products of conception in this present research recorded 56 cases representing 8.0% with peak age range of 20-39 years, which is lower than the findings of other authors. Forae and Aligbe [25] reported that retained product of conception was the most commonly encountered (27.7%) among reproductive women in Benin City, Nigeria. Similarly, Ozumba *et al.* [6] reported 20.7% in Enugu, Nigeria with mean age range of occurrence as 24.9-36.9 years.

Cervical inflammation may be acute or chronic. Each of these may be as a result of non-infective or infective causes. Non-infective cervicitis is most often caused by chemical while the infective is commonly associated with sexually transmitted diseases. Chronic Cervicitis was the fourth most prevalent lesion in this research with 6.3% but lower than 17.1% reported by Nwachokor and Forae [15]. Cervical cancer has been reported severally by researchers as the commonest malignancy of the female genital tract in developing countries. However, this has been mostly through pap smear screening. The histopathological tissue block screening of squamous cell carcinoma in our present study show prevalence rate of 1.9%. This is similar to the 5% of squamous cell carcinoma reported in a clinico-pathological assessment of hysterectomies [33].

The limitation of this research is similar to that of our earlier study [34]. This present study was based on data collected from only one tertiary hospital, and thus, may not be representative of the actual prevalence of the various gynaecological lesions in the general population. Also, several independent

factors of interest including participants' occupation and race/ethnicity were not captured in the original data making it impossible to associate these factors with the distribution. On the other hand, the strength of our study lies on the fact that our data were hospital based individual level data and thus, make for reliable findings.

5. Conclusion

In conclusion, leiomyoma, ovarian cyst and retained product of conception were the most prevalent gyna-ecological lesions affecting women in the City of Port Harcourt in the Niger Delta Region of Nigeria. However, application of effective intervention and control measures such as alteration of lifestyle (multiple sexual partners, alcohol, smoking etc), and early detection, and reduced environmental pollution could help reduce the incidence of these diseases. Further studies that attempt to associate exposures like environmental pollution and lifestyles to the various gynaecological lesions are highly recommended.

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Ethical Approval

The project was approved by the hospital management board of Rivers State, Nigeria through the Ethics Committee of RSUTH formerly BMSH on the 28th of January 2015.

References

1. Younglai EV, Holloway AC, Foster WG. Environmental and occupational factors affecting fertility and IVF success. Human Reproduction Update 11 (2005): 43-57.
2. Parkin DM, Muir CS. Cancer Incidence in Five Continents. Comparability and quality of data. IARC Sci Publ (1992): 45-173.
3. Pisani P, Bray F, Parkin DM. Estimates of the world-wide prevalence of cancer for 25 sites in the adult population. Int J Cancer 97 (2002): 72-81.
4. Howlader N, Noone AM, Krapcho M. SEER Cancer Statistics Review; 1975- 2008 SEER data Submission. In.: SEER (2011).
5. Egwuatu VE E, Ejeckam GC. An analysis of tumours of the female genital tract in Enugu Nigeria. A hospital based tumour registry review. Bulletin Cancer (Paris) 67 (1985): 535.
6. Ozumba BC, Nzegwu M, Anyikam A. Histological Patterns of Gynecological Lesions in Enugu, Nigeria. A Five-Year Review from January 1, 2000 to December 31 st 2004. In: 2011 (2011).
7. Agboola AOJ, Banjo AAF, Abudu EK. Pattern of Female Genital Malignancy in a Semi-Urban Tertiary Health Centre. Nigerian Hospital Practice 1 (2007): 84-86.
8. Mazur MT, Kurman RJ. Diagnosis of endometrial biopsies and curettings: A practical approach, 2nd edn. New York: Springer science (2005).
9. WHO. Comprehensive cancer control. A guide to essential practice Geneva: World Health Organization (2006).

10. Leydon GM, Boulton M, Moynihan C, et al. Cancer patients' information needs and information seeking behaviour: in depth interview study. Bmj 320 (2000): 909-913.
11. De Nooijer J, Lechner L, De Vries H. Early detection of cancer: knowledge and behavior among Dutch adults. Cancer Detect Prev 26 (2002): 362-369.
12. Sarkar M, Konar H, Raut DK. Gynecological malignancies: epidemiological characteristics of the patients in a tertiary care hospital in India. Asian Pac J Cancer Prev 13 (2012): 2997-3004.
13. Onyije FM. Eroje MA, Fawehinmi HB. Trends in Cervical Cancer Incidence in the University of Port Harcourt Teaching Hospital. Continental Journal of Tropical Medicine 4 (2010): 1-5.
14. You W, Dainty LA, Rose GS, et al. Gynecologic malignancies in women aged less than 25 years. Obstet Gynecol 105 (2005): 1405-1409.
15. Nwachokor FN, Forae GC. Morphological spectrum of non-neoplastic lesions of the uterine cervix in Warri, South-South, Nigeria. Niger J Clin Pract 16 (2013): 429-432.
16. Okeke T, Onah N, Ikeako L, et al. The frequency and pattern of female genital tract malignancies at the university of Nigeria teaching hospital, enugu, Nigeria. Ann Med Health Sci Res 3 (2013): 345-348.
17. Forae GD, Aligbe JU. A histopathological overview of ovarian lesions in Benin City, Nigeria: How common are the functional cysts? International Journal of Medicine and Public Health 4 (2014): 265-268.
18. Lethaby A, Suckling J, Barlow D, et al. Hormone replacement therapy in post-menopausal women: endometrial hyperplasia and irregular bleeding. Cochrane Database Syst Rev 2004 (3): Cd000402.
19. Sinaii N, Cleary SD, Ballweg ML, et al. High rates of autoimmune and endocrine disorders, fibromyalgia, chronic fatigue syndrome and atopic diseases among women with endometriosis: a survey analysis. Human Reproduction 17 (2002): 2715-2724.
20. Sourial S, Tempest N, Hapangama DK. Theories on the Pathogenesis of Endometriosis. International Journal of Reproductive Medicine 2014 (2014): 179515.
21. Zanotti K. Endometrial, Ovarian, and Cervical Cancer (2010).
22. Nnamdi D, Singh S, Ahmed Y, et al. Histopathological Features of Genital Tract Malignancies as Seen in a Tertiary Health Center in North-Western Nigeria: A 10-year Review. Annals of medical and health sciences research 4 (2014): S213-S217.
23. Seleye-Fubara D, Uzoigwe SA, Akani CI. Pathology of vaginal cancers in Port Harcourt, Nigeria. A 14-year study. Niger J Clin Pract 10 (2007): 330-334.
24. Sanni WO, Ocheke AN, Oyebode T, et al. Pattern of Gynaecological Malignancies in Jos. Journal of Obstetrics and Gynaecology 30 (2013): 97-102.
25. Forae GD, Aligbe JU. Histopathological patterns of endometrial lesions in patients with abnormal uterine bleeding in a cosmopolitan population. Journal of Basic Clinical and Reproductive Science 2 (2013): 101-104.
26. Mohammed A, Shehu SM, Ahmed SA, et al. Uterine leiomyomata: A five year clinicpathological review in Zaria, Nigeria. .

Nigerian Journal of surgical Research 2 (2005): 206-208.

27. Bukar M, Audu BM, Yahaya UR. Hysterectomy for benign Gynaecological conditions at Gombe, North Eastern Nigeria. Nigeria Medical Journal 51 (2010): 35-38.
28. Nnoli MA. NC, Ebughe GA, Nkwo EC. Prevalence of Leiomyoma in South Eastern Tertiary Hospital of Nigeria from 2005-2012. Journal of Dental and Medical Sciences 6 (2013): 71-81.
29. Akinyemi BO, Adewoye BR, Fakoya TA. Uterine fibroid: a review. Niger J Med 13 (2004): 318-329.
30. Ikechebelu JI. Prevalence of gynaecological diseases in Nnewi, Nigeria. Niger J Clin Pract 8 (2005): 136-137.
31. Durfee SM, Frates MC, Luong A, et al. The sonographic and color Doppler features of retained products of conception. J Ultrasound Med 24 (2005): 1181-1186.
32. Alsibiani SA. Value of Histopathologic Examination of Uterine Products after First-Trimester Miscarriage. BioMed Research International 2014 (2014): 863482.
33. Samaila MOA, Adesiyun AG, Agunbiade OA, et al. Clinico-Pathological Assessment of Hysterectomies in Zaria. European Journal of General Medicine 6 (2009): 150-153.
34. Onyije FM, Ngokere AA, Ligha EA, et al. A 35-year standardized prediction estimates for gynecological lesions in oil and gas exploration and production city in the Niger Delta. Tropical Journal of Obstetrics and Gynaecology 36 (2019): 8-14.