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Spectrum of General Surgery Disease Conditions at The Rivers State University Teaching: A Six-Year Study

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Abstract

Background: Surgical diseases are significant contributors to global burden of disease. Although surgical services at this institution have long been provided, the pattern of surgical diseases has not been well documented. This study therefore is an attempt to provide evidence of the spectrum of general surgical diseases seen in the Rivers State University Teaching Hospital from January 2016 to December 2021.

Materials and Methods: A retrospective descriptive cross-sectional study was carried out at the Surgery Department with the accident & emergency department, surgical outpatient clinics, and operating theatre as study sites. Data on total population of general surgery cases found in the registers from 2016 to 2021 was collated, tabulated and the mean values were analysed using the Microsoft Excel Spreadsheet and SPSS version 23.

Results: There were a total of 1618 (24.3%) benign breast diseases, 1507 (22.6%) inguinal hernias, 1154 (17.3%) malignant breast diseases seen in the clinics. Only 58 (0.9%) malignant goiters, 215 (3.2%) other goiters, 107 (1.5%) femoral hernias, and 590 (8.9%) other hernias were seen. There were 1666 emergency general surgical conditions seen within the six-year study period, out of which 1019 (61.2%) were acute abdominal conditions, and 513 (30.8%) were trauma-related injuries. Two thousand three hundred and seven (2307) general surgical procedures were performed, out of which 659 (28.6%) were trauma-related conditions, and 235 (10.2%) were specifically gunshot injuries.

Conclusion: Breast diseases and hernias were the most commonly seen in clinics, while acute abdominal conditions and trauma-related injuries were the most prevalent emergency general surgical conditions in our practice.

Keywords: ***Spectrum; Pattern; General surgery diseases; RSUTH; Port Harcourt; Nigeria***

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1. Introduction

Surgical diseases are significant contributors to global burden of disease [1]. Surgically treatable diseases are estimated to be 11% of this global disease burden in 2006 [2], and 28%-32% in 2015 [3]. Among these in most regions of the world, surgical emergencies were reported to contribute to more than fifty percent of admission [4,5]. There is unmet surgical need especially in the developing countries [6-8], and global information showcases differences in surgical care availability and pattern. In a review, the pattern of surgical diseases is also known to be changing, especially in the low and medium-income countries [9]. Among the global surgical diseases that call for emergency attention, general surgical diseases contribute the most [9].

Sudden onset abdominal pain that may require surgical intervention, referred to as acute abdomen, is a prototype of what is in the menu of emergency general surgical practice. In a study of acute abdomen in Ghana, acute appendicitis accounted for 52% of cases followed by intestinal obstruction (26%) [10]. Intestinal obstruction used to be the most common cause of acute abdomen in most African countries as against acute appendicitis observed in developed countries [11-13]. The findings of a study from South-Western Nigerian setting for data collected between 2009 and 2010 revealed that acute appendicitis accounted for about 30% of cases of acute abdomen, followed by intestinal obstruction [14]. In north-Central Nigeria, there were more cases of acute appendicitis than intestinal obstruction within the one-year study period in 2011 [5].

Most of the studies on surgical disease pattern were carried out more than ten years ago and may not reflect the current status. The understanding of pattern of diseases provides information for better planning (training needs and workforce distribution) and hence improved service delivery to a population. Disease pattern is known to vary with region, environmental exposure and demographics [15,16]. Surgical services at our institution have long been provided, however the peculiar pattern of surgical diseases among our people appear not to be well documented for the records. This study therefore provides evidence of the spectrum of general surgical diseases seen at the Rivers State University Teaching Hospital (RSUTH)from January 2016 to December 2021.

2. Materials and Methods

2.1 Research design

A retrospective descriptive cross-sectional study was done.

2.2 Study area

The study was carried out at the Rivers State University Teaching Hospital (RSUTH), a State-owned tertiary healthcare facility in Port Harcourt, the capital of Rivers State, South-South of the Federal Republic of Nigeria. The RSUTH serves as one of the two referral centers for the general hospitals in the 23 local government areas in Rivers State, and patients from some neighboring States. The other referral center being the University of Port Harcourt Teaching Hospital, a Federal Health institution.

2.3 Study sites

The Accident & Emergency unit, General Surgery (GS) outpatient clinics, and the operating theatre of the Surgery Department were the study sites.

2.4 Study population

All general surgery patients who were seen and treated at the Surgery Department of the Hospital within the six-year study period (from 2016 - 2021) were included in the study.

2.5 Sample size determination

All identified General Surgical (GS) conditions were included in the study.

2.6 Sampling method

Total population of General Surgery cases found in the register was used.

2.7 Study instrument

Ward, clinic, accident & emergency, and operating theatre registers were used to obtain data imputed into a proforma designed for the study.

2.8 Variables

Information on demographics, type and total number of general surgical cases attended to per year, etc., were obtained.

2.9 Bias

The information used for this study was limited to that contained in the admissions and discharge registers of the surgical clinics, emergency department and the surgical operating theatre, hence description of outcome of care is not part of this study. Additionally, some incomplete data in the registers were excluded.

2.10 Validity/Reliability of instrument

The study data was scrutinized by all the authors for authenticity or otherwise before use.

2.11 Data Analysis

Data obtained was tabulated and the mean age of patients was analyzed using the Microsoft Excel Spreadsheet and SPSS version 23.

3. Results

Analysis of data in the six-year study reveals a spectrum of disease conditions that constituted the workload of the General Surgeon in our center, as shown in the tables for demographics, clinic attendance, emergency ward presentations, and the operating theatre work.

TABLE 1 shows the demographic characteristics of patients who presented with emergency general surgical conditions at the Accident and Emergency Department. There were 84 (51.9%) males and 78 (48.1%) females who presented with acute

appendicitis, with a mean age of 27.4 years. One hundred and ninety-seven (85.3%) males and 34 (14.7%) females had gunshot injuries, with a mean age of 29.6 years. Only twenty-six patients who were all females had cholecystitis / cholelithiasis with a mean age of 41.8 years. Seventy patients presented with complications of malignant breast cancer with a mean age of 43.7 years, and all were females.

TABLE 1. **Demographic Pattern of GS Diseases in Accident and Emergency Dept.**

S/N	Pathologic Conditions	Males	Females	Total	Mean Age (Years)
Acute Abdomen					
1	Acute Appendicitis	84 (51.9%)	78 (48.1%)	**162**	**27.4**
2	Obstructed Inguinal Hernias	65 (77.4%)	19 (22.6%)	**84**	**47.9**
3	Other Hernias (Epigastric / Incisional Hernias / Femoral Hernias)	14 (33.3%)	28 (66.7%)	**42**	**35.6**
4	Other Intestinal Obstruction	101 (45.9%)	119 (54.1%)	**220**	**40.7**
5	Perforated Peptic Ulcer	54 (35.1%)	100 (64.9%)	**154**	**41.7**
6	Acute Cholecystitis/Cholelithiasis	-	26 (100%)	**26**	**41.9**
Trauma					
7	Gunshot Injuries	197 (85.3%)	34 (14.7%)	**231**	**29.6**
8	Other Trauma	141 (50.0%)	141 (50.0%)	**282**	**39.8**
Infections					
9	Mastitis/Breast Abscess	-	9 (100%)	**9**	**32.3**
Malignant Neoplastic Diseases					
10	Malignant Breast Diseases	-	70 (100%)	**70**	**43.7**
11	Gastric Tumours	7 (46.7%)	8 (53.3%)	**15**	**47.5**
12	Colorectal Tumours	6 (42.9%)	8 (57.1%)	**14**	**59.5**

TABLE 2 shows the demographic characteristics of patients who were seen at the General Surgery out-patient clinics within the 6-year study period. Breast disease was the most common single organ surgical condition with female preponderance - females being 1549 (95.7%) for benign, and 1139 (98.7%) for malignant breast disease. The mean age for malignant breast disease was 46.9years, and 41.9years for benign breast disease. Gallbladder disease was 133 (91.7%) in females and 12 (8.3%) in males, with a mean age of 44.4 years. There were 1507 inguinal hernias seen and 1069 (70.9%) was in males, while 438 (29.1%) was seen in females. The mean age for inguinal hernia was 53.3 years.

TABLE 3 shows the types and number of General Surgery cases seen at the surgical out-patient clinic per year within the 6-year study period. There were a total of 1618 (24.3%) benign breast diseases, 1507 (22.6%) inguinal hernias, 1154 (17.3%) malignant breast diseases. Only 58 (0.9%) malignant goiters, 215 (3.2%) other goiters, 107 (1.5%) femoral hernias, and 590

(8.9%) other hernias were seen. Gallbladder disease was 145 (2.2%), colorectal cancer 70 (1.1%), while pancreatic tumor/obstructive jaundice was a total of 17 (0.3%). There was a steady increase in the number of cases seen in year 2017 (893), 2018 (967), 2019 (1007), 2020 (1285), to 2021 (1569).

TABLE 2. **Demographic Pattern of GS Diseases in Surgical Out-Patient Clinics.**

S/N		Males	Females	Total	Mean Age (Years)
Metabolic/Degenerative Diseases					
1	Benign Goitre	42 (18.6%)	173 (81.4%)	**215**	43.1
2	Cholecystitis / Cholelithiasis	12 (8.3%)	133 (91.7%)	**145**	44.4
Hernias					
3	Inguinal Hernias	1069 (70.9%)	438 (29.1%)	**1507**	53.3
4	Femoral Hernias	29 (28.7%)	72 (71.3%)	**101**	32.8
5	Other Hernias	118 (20%)	472 (80%)	**590**	39.6
Sub-Acute Abdominal Conditions					
6	Sub-Acute Appendicitis	66 (38.2%)	107 (61.8%)	**173**	31.4
7	Peptic Ulcer	7 (43.7%)	9 (56.3%)	**16**	42.9
8	Intestinal Obstruction	73 (49.3%)	75 (50.7%)	**148**	32.9
9	Others	93 (38.4%)	149 (61.6%)	**242**	41.5
Trauma-related Injuries					
10	Gunshot Injuries (Follow-Up)	151 (98.1%)	3 (1.9%)	**154**	33.8
11	Other Trauma Injuries (Follow-Up)	143 (62.4%)	86 (37.6%)	**229**	41.4
Benign Neoplastic Diseases					
12	Parotid Tumour	11 (61.1%)	7 (38,9%)	**18**	38.9
13	Benign Breast Diseases	69 (4.3%)	1549 (95.7%)	**1618**	41.9
14	Benign Skin Diseases	65 (56.0%)	51 (44%)	**116**	30.0
Malignant Neoplastic Diseases					
15	Malignant Skin Diseases	64 (70.3%)	27 (29.7%)	**91**	32.8
16	Malignant Goitre	15 (25.9%)	43 (74.1%)	**58**	44.2
17	Malignant Breast Disease	15 (1.3%)	1139 (98.7%)	**1154**	46.9
18	Pancreatic Tumour	9 (52.9%)	8 (47.1%)	**17**	61
19	Gastric Tumour	4 (100%)	-	**4**	43.0
20	Colorectal Tumour	48 (68.6%)	22 (31.4%)	**70**	49.5

TABLE 3. **Year-Based General Surgery Disease Conditions in Out-Patient Clinics.**

S/N	DISEASE TYPE	2016	2017	2018	2019	2020	2021	**TOTAL**
Metabolic/Degenerative Diseases								
1	Goitre (Others)	20	30	40	22	37	66	**215 (3.2%)**
2	Gallbladder Diseases	16	12	28	14	24	51	**145 (2.2%)**
Hernias								
3	Inguinal Hernias	214	195	207	177	294	420	**1507 (22.6%)**
4	Femoral Hernias	25	21	14	18	14	9	**101 (1.5%)**
5	Other Hernias	92	52	98	115	103	130	**590 (8.9%)**
Sub-Acute Abdominal Conditions								
6	Sub-Acute Appendicitis	39	14	42	31	28	19	**173 (2.6%)**
7	Peptic Ulcer	1	1	-	1	4	9	**16 (0.2%)**
8	Intestinal Obstruction	23	26	21	27	25	26	**148 (2.2%)**
9	Other Conditions	27	35	37	31	43	69	**242 (3.6%)**
Trauma-related Injuries								
10	Gunshot Injuries (Follow Up)	19	31	26	23	27	28	**154 (2.3%)**
11	Other Trauma Injuries (Follow-up)	37	43	33	42	31	43	**229 (3.4%)**
Benign Neoplastic Diseases								
12	Parotid Tumour	4	1	3	3	6	1	**18 (0.3%)**
13	Benign Breast Diseases	245	234	149	245	351	394	**1618 (24.3%)**
14	Benign Skin Diseases	29	14	16	15	11	31	**116 (1.7)**
Malignant Neoplastic Diseases								
15	Malignant Skin Diseases	29	7	24	4	15	12	**91 (1.4%)**
16	Malignant Goitre	14	5	11	9	10	9	**58 (0.9%)**
17	Malignant Breast Disease	105	163	201	221	240	224	**1154 (17.3%)**
18	Pancreatic Tumour/Obstructive Jaundice	-	-	3	-	5	9	**17 (0.3%)**
19	Gastric Tumour	1	1	-	-	-	2	**4 (0.06%)**
20	Colorectal Tumour	5	8	14	9	17	17	**70 (1.1%)**
TOTAL		945	893	967	1007	1285	1569	**6666 (100%)**

TABLE 4 shows the number and types of general surgical conditions seen at the Accident and Emergency Department per year. There were 1666 emergency general surgical conditions seen within the six-year study period, out of which 1019 (61.2%) were acute abdominal conditions, and 513 (30.8%) were trauma-related injuries. This was closely followed by complications of malignant disease conditions (99 = 5.9%), and some metabolic / degenerative diseases (26 = 1.6%).

TABLE 4. **Year-Based General Surgery Disease Conditions in Accident and Emergency Department.**

S/N	DISEASE TYPE	2016	2017	2018	2019	2020	2021	**TOTAL**
Acute Abdomen								
1	Acute Appendicitis	12	26	21	35	26	42	**162 (9.7%)**
2	Perforated Peptic Ulcer	14	24	22	45	18	31	**154 (9.2%)**
3	Intestinal Obstruction (non-hernia related)	31	39	28	48	39	35	**220 (13.2%)**
4	Obstructed Inguinal Hernia	29	12	4	14	3	22	**84 (5.0%)**
5	Epigastric/Incisional Hernias/Femoral Hernias	17	3	2	6	5	9	**42 (2.5%)**
6	Acute Cholecystitis/Cholelithiasis	6	3	2	4	5	6	**26 (1.6%)**
7	Other Conditions	45	51	46	70	62	83	**357 (21.4%)**
Trauma								
8	Gunshot Injuries	36	37	38	43	47	30	**231 (13.9%)**
9	Other Trauma Injuries	49	47	39	54	49	44	**282 (16.9%)**
Infections								
10	Mastitis/Breast Abscess	1	1	2	3	2	-	**9 (0.5%)**
Malignant Neoplastic Diseases								
11	Malignant Breast Diseases	10	17	1	4	3	35	**70 (4.2%)**
12	Gastric Tumours	8	-	2	3	-	2	**15 (9.0%)**
13	Colorectal Tumours	8	-	-	1	1	4	**14 (0.8%)**
TOTAL		266	260	207	330	260	343	**1666 (100%)**

TABLE 5 shows the types and numbers of General Surgery disease conditions operated within the six-year study period. All the surgeries were carried out using the open surgical technique. Two thousand three hundred and seven general surgical procedures were performed. There were 612 (26.5%) acute abdominal conditions (excluding hernias) operated, among which intestinal obstruction was 263 (11.4%), acute appendicitis was 246 (10.7%). There were 659 (28.6%) surgeries for trauma-related conditions, among which gunshot injury was 235 (10.2%).

TABLE 6 displays the comparison of demographic pattern and year-based general surgery disease conditions in Accident and Emergency (A/E) wards. A Pearson's chi-squared test was carried out to assess whether demographic pattern and year-based general surgery disease conditions in Accident and Emergency wards were related. However, it was observed that the p-values of these pathologic conditions; acute abdomen, trauma, and malignant neoplastic diseases were "0.000", with their positive chi-squares (665.021, 491.901, and 42.017), while no statistics was computed for infections because its pattern and year-based General Surgery disease conditions was constant. Thus, we reject the "null" hypothesis that there was significant evidence of an association between the demographic pattern and year-based general surgery disease conditions in Accident and Emergency wards.

TABLE 5. **Year-Based General Surgery of Disease Conditions Operating Theatre (Using Open Surgical Techniques).**

S/N	DISEASE TYPE	2016	2017	2018	2019	2020	2021	**TOTAL**
Metabolic/Degenerative Diseases								
1	Benign Goitres	2	-	2	6	3	6	**19 (0.8%)**
2	Acute Cholecystitis/Cholelithiasis	2	3	2	3	5	6	**21 (0.9%)**
Hernias								
3	Inguinal Hernias	39	57	65	52	58	49	**320 (13.9%)**
4	Femoral Hernias	10	15	14	7	12	17	**75 (3.3%)**
5	Other Hernias	17	30	42	15	28	27	**159 (6.9%)**
Acute Abdomen								
6	Acute Appendicitis	42	37	48	38	40	41	**246 (10.7%)**
7	Peptic Ulcer	-	-	1	-	-		**1 (0.04%)**
8	Intestinal Obstruction	48	23	48	39	49	56	**263 (11.4%)**
9	Other Conditions	15	24	19	13	20	11	**102 (4.4%)**
Trauma								
10	Gunshot Injuries	39	36	43	40	40	37	**235 (10.2%)**
11	Other Trauma-related Injuries	42	45	57	57	45	58	**304 (13.2%)**
12	Others	15	24	19	11	20	31	**120 (5.2%)**
Benign Neoplastic Diseases								
13	Benign Skin Lesions	27	18	17	9	18	32	**121 (5.2%)**
14	Benign Breast Diseases	17	19	17	13	17	23	**106 (4.6%)**
Malignant Neoplastic Diseases								
15	Malignant Skin Lesions	3	9	6	7	9	9	**43 (1.9%)**
16	Malignant Goitres	2	3	1	3	4	8	**21 (0.9%)**
17	Malignant Breast Disease	27	15	11	13	12	30	**108 (4.7%)**
18	Colorectal Tumours	6	1	13	9	6	8	**43 (1.9%)**
TOTAL		353	359	425	335	386	449	**2307 (100%)**

TABLE 6. **Comparison of Demographic Pattern and Year-Based General Surgery Disease Conditions in Accident and Emergency.**

Pathologic Conditions	**Demographic Pattern**	**Year-Based**	**Degree of Freedom**	**P-values**	**Chi-Square**
Acute Abdomen	688 (52.6%)	1045(62.7%)	4	0.000	665.021
Trauma	513 (39.2%)	513 (30.8%)	5	0.000	491.901
Infections	9 (0.69%)	9 (0.54%)	-	-	-
Malignant Neoplastic diseases	99 (7.6%)	99 (5.9%)	5	0.000	42.017

TABLE 7 shows the comparison of demographic pattern and year-based General Surgery disease conditions in surgical out-patients' clinic. A Pearson's chi-squared test was carried out to assess whether demographic pattern and year-based General Surgery disease conditions in surgical out-patients' clinic were related. Nonetheless, it was observed that the p-values of these pathologic conditions; Metabolic degenerative diseases, hernia, acute abdomen, trauma related injuries, benign neoplastic diseases, and malignant neoplastic diseases were "0.000", with their positive chi-squares (279.328, 2151.329, 431.830, 313.407, 838.183, and 1383.936). The null hypothesis was also rejected that there was significant difference between the demographic pattern and year-based General Surgery disease conditions in surgical out-patients' clinic.

TABLE 7. **Comparison of Demographic Pattern and Year-Based General Surgery Disease Conditions in Surgical Out-Patients' Clinic.**

Pathologic Conditions	Demographic Pattern	Year-Based	Degree of Freedom	P-values	Chi-Square
Metabolic degenerative diseases	360 (5.4%)	360 (5.4%)	5	0.000	279.328
Hernia	2198 (33%)	2198 (33%)	5	0.000	2151.329
Acute Abdomen	579 (8.6%)	579 (8.6%)	5	0.000	431.830
Trauma related diseases	383 (5.7%)	383 (5.7%)	5	0.000	313.407
Benign Neoplastic diseases	1752 (26.3%)	1752 (26.3%)	5	0.000	838.183
Malignant Neoplastic diseases	1394 (21.06%)	1394 (21.06%)	5	0.000	1383.936

TABLE 8 reveals the comparison of demographic pattern and year-based General Surgery disease conditions in operating theatre (using open surgical techniques). A Pearson's chi-squared test was as well performed to ascertain whether demographic pattern and year-based General Surgery disease conditions in operating theatre (using open surgical techniques) were related. However, it was observed that the p- values of these pathologic conditions; acute abdomen, trauma related injuries, benign neoplastic diseases, and malignant neoplastic diseases were "0.000", with their positive chi-squares (396.730, 269.088, 179.742, and 194.156), while no statistics was computed for metabolic degenerative diseases and hernia because their pattern and year-based general surgery disease conditions were constant. The null hypothesis was also rejected that there was significant difference between the demographic pattern and year-based General Surgery disease conditions in operating theatre (using open surgical techniques).

TABLE 8. **Comparison of Demographic Pattern and Year-Based General Surgery Disease Conditions in Operating Theatre (Using Open Surgical Techniques).**

Pathologic Conditions	Demographic Pattern	Year-Based	Degree of Freedom	P-values	Chi-Square
Metabolic degenerative diseases	360 (5.4%)	40 (1.7%)	-	-	-
Hernia	2198 (33%)	554 (24.1%)	-	-	-
Acute Abdomen	579 (8.6%)	612 (26.54%)	5	0.000	396.730
Trauma related diseases	383 (5.7%)	659 (28.6%)	3	0.000	269.088
Bening Neoplastic diseases	1752 (26.3%)	227 (9.8%)	5	0.000	179.742
Malignant Neoplastic diseases	1394 (21.06%)	2522 (9.4%)	5	0.000	194.156

4. Discussion

The findings of this study highlight the spectrum of general surgical diseases presenting as emergent and non-emergent cases. The Rivers State University Teaching Hospital is a referral centre for the general hospitals in the 23 local government councils in Rivers State and a few other neighbouring States. Breast diseases followed by hernia accounted for the bulk of the workload of general surgeons as seen in the surgical out-patient clinics, expectedly with female preponderance for breast diseases. The mean age for malignant breast disease in this report was 46.9years. This relatively aligns with the findings of other studies in Nigeria [17-21]. Males dominated cases of hernias and trauma-related conditions in our practice. However, among females, there were more cases of inguinal than femoral hernias. The demographics of common emergency surgical diseases revealed that majority of gunshot injury victims were males. Similar finding has been observed among orthopaedic patients with fractures in our environment [22,23]. Also, relatively more males than females had acute appendicitis. Seventy women had emergency admissions for complications of malignant breast disease. This finding highlights the occurrence of advance breast cancer in our environment, which has been severally reported [24-27]. The few patients who had gallbladder diseases were all females. Our finding is similar to the paucity of gallbladder diseases reported in earlier studies [28-30].

Among the groups of General Surgical diseases presenting as emergencies, acute abdomen was the most frequent, with intestinal obstruction being the single most common pathology (followed by acute appendicitis). This pattern differs from the report from other climes where acute appendicitis is more prevalent [31-33]. Our finding also differs from a western Nigerian study in which acute appendicitis was the commonest cause of acute abdomen [14], and also another study done in Port Harcourt more than ten years ago [34]. Next to acute abdomen in Emergency Room presentations was trauma-related injuries. Trauma accounts for almost a third of General Surgical emergencies in our practice. We encountered double-digit gunshot injuries per year in our emergency department, as against the single-digit reported in a study carried out in a Teaching Hospital in in Western Nigeria [14]. However, in this quoted study, only abdominal injuries were reported, and the study was carried out about 8 years ago. Our experience in the operating theatre also shows that trauma-related injury (28.6% of all surgeries) was the most common single group constituting the burden of work for the general surgeons in our center. This apparent discordance with the Emergency Room finding, could be explained by the fact that not all cases of acute abdomen eventually end up in the Operating Room - as some patients either decline surgery or sign against medical advice, which is often not the case with trauma cases. After trauma in Operating Room experience was acute abdominal conditions (26.5% of all surgeries) for which surgery for intestinal obstruction (11.4%) ranked highest.

On the whole, the pattern of general surgical diseases seen in our centre at the surgical out-patient clinics, in descending order of occurrence was benign breast disease (1618 in six years), inguinal hernias (1507), malignant breast diseases (1154), other hernias (590), sub-acute abdominal conditions (variable), follow-up of trauma-related injuries (variable), gallbladder disease (145), femoral hernias (107), colorectal cancer (70), etc. There were therefore more cases of breast diseases (benign and malignant) and hernias (combined) in our practice than other surgical pathological conditions.

Among the neoplastic General Surgical diseases that we encounter in our practice, breast cancer, colorectal cancer, pancreatic cancer/obstructive jaundice, and gastric cancer were notable. Breast cancer was more commonly seen, with advanced diseases presenting in large numbers at the accident and Emergency Department. Part of the reasons for these late presentations is that the care of these disease conditions like some other cancers require the combination of modes of care such as surgery,

chemotherapy, radiotherapy, immunotherapy, etc. which are either are either unaffordable or unavailable. Surgical care (for other surgical diseases inclusive) is available and is commonly carried out but require some upgrade to modern minimal invasive techniques requiring the use of extra instruments and equipment that require more training and experience. Chemotherapy is also offered to patients in our practice, but most of the patients are unable to afford the high cost of it without insurance coverage. Radiotherapy is not readily available to our patients in Port Harcourt, implying that patients would have to be referred to other cities, and some patients are unable to travel down for such care. However, efforts are being made to establish a cancer centre in Port Harcourt, which we hope would address some of these challenges. Immunotherapy/targeted therapy, although available is so expensive that most of our patients are not able to take advantage of it due to its high cost.

The observed increase in the number of cases seen per year at the surgical out-patient clinics could possibly be explained by increase in population of the State. However, the upgrade in the status of the hospital from a specialist hospital to a Teaching Hospital in the year 2018 following the establishment of a Medical School in the State-owned University is a strong reason. Additionally, this upgrade in status not only attracted equipment, but also involved improvement in the physical structures of the facilities which provided some comfort for the patients relative to other hospitals in our environment. These could have tilted the traffic of patients in favor of the health facility. However, the absence of laparoscopic procedures and upper and lower gastrointestinal procedures in the surgical arsenal of General Surgical practice is clearly visible. Although these modern inclusions that improve the diagnosis and treatment of surgical diseases have been in existence in other climes, absence of desired equipment and desired training have hampered its practice in our environment. However, efforts are ongoing to make available and functional the equipment and instruments needed for this purpose.

The chi-square results for data comparison were significant. This suggests that the pathologic conditions in accident and emergency wards, surgical out patients, and Operating Theatre are associated with each other. The spectrum of General Surgical diseases as highlighted in this study could be useful to healthcare managers and administrators in our subregion for planning, advocacy, and patient care.

5. Study Limitations

Our study has some limitations, especially as it bothers on incomplete data - all cases with incomplete data were excluded from the study. General Surgical disease conditions attended to in other departments of the hospital (following consults from those departments) without surgery in theatre, were not included in the study. Additionally, the study could not capture the outcome of care of the General Surgery cases, because the source of data for the study was the registers of attendance at the clinics, Emergency Department, and the Operating Theatre.

6. Conclusion

Benign breast disease, hernias, and malignant breast diseases were the most common general surgical conditions seen in clinic setting in our practice. Acute abdominal conditions and trauma-related injuries were the most prevalent emergency general surgical conditions that keep the General Surgeons busy. There was no record of any endoscopic / minimal invasive general surgical procedures carried out within the study period. There is need for targeted response for the greater number of the public, through improvement the number of trained personnel, equipment and materials needed for service delivery. Areas of attention therefore should include but not limited to breast care, trauma care and minimal invasive surgery.

7. Acknowledgement

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8. Ethical Considerations

The approval of the Research Ethics Committee of the Rivers State University Teaching Hospital was obtained before the commencement of the study.

9. Study Funding

The study was funded privately by the researchers.

10. Conflict of Interest

None declared.

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