

Original Research Article

Pattern of orthopaedic case presentations at the rivers state university teaching hospital: a ten-year review

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ABSTRACT

Background: Pattern of diseases help institutions and governments to know the dominant disease conditions and how to allocate scarce resources. Knowledge of the pattern of orthopedic disease conditions seen and treated in the Rivers State university teaching hospital will help in guiding the repositioning effort of the department/discipline, especially in the light of the new status of the institution as a teaching hospital for teaching, service delivery and research. The aim of this study therefore was to determine the pattern of orthopedic cases seen in the surgery department of the Rivers State university teaching hospital from January 2010 to January 2019.

Methods: A descriptive retrospective cross-sectional study was carried out at the emergency room, clinic, operating theatre, and wards of the surgery department of the Rivers State university teaching hospital, using hospital registers. The study was analyzed using the Microsoft excel spreadsheet.

Results: There were 2854 orthopedic emergency room cases seen, comprising 621 fractures, 463 lumbar spondylosis/spondylolisthesis, 392-foot ulcer/sepsis, 375 dislocations, 310 acute osteomyelitis, and 864 osteoarthritis with other conditions. The common orthopedic cases seen in the out-patient clinics in descending order of occurrence were lumbar spondylitis / spondylolisthesis (881), osteoarthritis (655), fractures (560), dislocations (227), etc.

Conclusions: Trauma-related disease care constituted the bulk of work of the orthopedic surgeon in our environment in the emergency room, operating theatre and ward admissions, and younger males were more affected.

Keywords: Pattern, Orthopaedic cases, Ten-year review, RSUTH, Port Harcourt, Nigeria

INTRODUCTION

Pattern of disease (or health) provides a panoramic view of the spectrum in focus, detectable from prenatal observations to mortality figures, and are useful for planning, advocacy and distribution of resources. The interest of the world health organization on the global burden and pattern of disease is known and cannot be overemphasized.¹ The need for partnership between orthopedic surgeons in the developed and developing worlds for improvement in clinical care, teaching, and research, has long been advocated.² In a study of the pattern of orthopedic injuries in Jammu India, road traffic accident was found to be the commonest cause of the

injuries.³ Significant difference has been reported in the pattern of low back pain seen among young athletes compared to the general adult population, hence shaping early recognition and diagnosis.⁴ In the United States of America in a study on horse-related sport injuries, a researcher reported specific orthopedic injury pattern, with recommendations on prevention.⁵

In the African setting, disappointing pattern of elective surgical case cancellations was studied and it was found that general surgery and orthopedic surgery cases were in the majority, with lack of theatre space and theatre facilities being the most frequent reasons for cancellations.⁶ In Ethiopia, a study on injuries and

violence showed that the major reason for the conflict which was characterized by significant morbidity (blunt injuries and fractures) and mortality was land issue, and most of those involved were drunk.⁷ A similar study in Addis Ababa reported road traffic accidents as being the commonest cause of injuries with young males dominating the victim population.⁸ Orthopedic emergencies were also studied in Addis Ababa, and a spectrum of injuries resulting from road traffic accident, falls, blow/assault, crush by heavy object, machine, bullet/blast, etc. were reported.⁹ The pattern of some other orthopedic conditions have been studied and reported in Africa.¹⁰⁻¹²

Nigeria is no exception, as patterns of orthopaedic surgical conditions have also been reported. A study describing the pattern of hand injuries seen at an emergency department in Kano documented a triad of occupational injuries, injuries from road accidents, and domestic accidents as being the most common.¹³ A pattern of low back pain, with 2914 new cases was reported in Ebonyi State in which significant proportion of patients were found to have such pain of mechanical origin that calls for prevention.¹⁴ A pattern of congenital orthopaedic malformations was described in Ibadan, and congenital talipes equinovarus was found to be the commonest.¹⁵ A study in Malawi showed similar findings.¹⁶ The pattern of other orthopaedic and orthopaedic-related conditions have been reported in some parts of Nigeria involving electrical injuries, bone tumours, gunshot injuries, cervical spine injuries, femoral fractures, tibial fractures, diabetic foot lesions, and extremity amputations.¹⁷⁻²⁷

Pattern of diseases help institutions and governments to know the dominant disease conditions and how to allocate scarce resources. Knowledge of the pattern of orthopedic disease conditions seen and treated in the Rivers State university teaching hospital will help in guiding the repositioning effort of the department/discipline, especially in the light of the new status of the institution as a Teaching Hospital for teaching, service delivery and research. This formed the basis for this study, whose aim was to determine the pattern of orthopedic cases seen in the surgery department (emergency room, clinics, operating theatre, and wards) of the Rivers State university teaching hospital from January 2010 to January 2019.

METHODS

Study area

The study was conducted in Port Harcourt the capital of Rivers State, Nigeria.

Study place and period

The emergency room, clinics, operating theatre, and wards of the surgery department of the Rivers State

university teaching hospital, Port Harcourt Nigeria were the study sites of this study carried out in the last quarter of year 2021.

Study design

A study was of cross-sectional descriptive study.

Study instrument

Patient registers used as a study instrument.

Study population

All orthopaedic patients identified in the registers were included in the study.

Sample size determination

Total population was used.

Sampling technique procedure

Total population was used.

Data analysis

The study data (on age, sex, types and number of orthopaedic cases) was scrutinized by all the authors for authenticity or otherwise, and analysed using Microsoft excel spreadsheet.

Ethical approval

The approval of research ethics committee of university of Port Harcourt teaching hospital was obtained.

RESULTS

Demographic characteristics of fracture case are shown in Table 1. There were more males who had fractures than females as evidenced by total number of cases seen in emergency room (males=311, females=278), operating theatre (males=166, females=87), wards (males=272, females=116). However, there were more females seen at the out-patient clinics (males=225, females=242). Mean age of patients with fractures were 38.2 years (clinics), 34.1 years (accident and emergency), 40.4 (operating theatre), and 36.4 (ward).

Table 2 shows the demographic characteristics of patients diagnosed with lumbar spondylosis/spondylolisthesis. There were 268 males and 384 females seen at the out-patient clinics; 195 males and 257 females seen at the accident and emergency room; 16 males and 12 females admitted to the wards; and 3 operated cases. The mean age for lumbar spondylosis was 54.1 years (clinic cases), 52.6 years (emergency room), 42.7 years (theatre), and 57.4 years (ward cases).

Table 3 show the demographics for cases of osteoarthritis. In the out-patient clinics, there were 177 males and 318 females; 128 males: 189 females (accident and emergency); 15 males: 21 females (operating theatre); and 18 males: 30 females (ward admission). The mean ages were 54.9 years (clinics), 50.3 years (accident and emergency), 42.1 years (operating theatre), and 50.8 years (ward admission).

Table 4 shows the orthopedic cases seen at the accident and emergency department. There were 2854 orthopedic emergency room cases seen, comprising 621 fractures, 463 lumbar spondylosis/spondylolisthesis, 392-foot ulcer/sepsis, 375 dislocations, 310 acute osteomyelitis, and 864 osteoarthritis with others.

Table 5 shows the type and number of orthopedic cases seen at the out-patient clinics. The common orthopedic

cases seen in descending order of occurrence were lumbar spondylitis/ spondylosis (881), osteoarthritis (655), fractures-following road traffic accidents, falls, gunshot-(560), dislocations (227), etc.

Table 6 show the type and number of orthopedic cases operated in operating theatre. Type cases in descending order of frequency were fractures (444), amputation-for DM gangrene, trauma, burns-(56), manipulation of dislocated joints (56), surgery for Blount’s disease (38), surgery for osteoarthritis (38), etc. Eight hundred and eighteen orthopedic cases were operated, and more than half of the cases were surgery for fractures.

The type and number of orthopaedic cases admitted to the ward are shown in Table 7. In descending order, there were 388 cases of fractures (RTA, falls, gunshot), 143 cases of bone tumours, 97 dislocations, etc.

Table 1: Demographics of fractures cases.

Variables	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Out-patient clinics											
Mean age (Years)	37.8	40.3	32.1	44.5	38.2	37.2	44.0	30.3	38.6	38.3	38.2
Male	28	13	20	26	23	18	19	20	31	27	225
Female	25	17	12	30	25	19	37	21	29	27	242
Accident and emergency											
Mean age (Years)	35.9	33.5	45.8	34.5	37.2	37.6	37.6	37.6	39.8	39	34.1
Male	29	22	26	34	28	38	29	35	35	35	311
Female	21	24	27	25	30	37	29	36	24	25	278
Operating theatre											
Mean age (Years)	40.6	43.7	38.2	34.2	51.1	40.4	41.9	34.9	39.7	39.1	40.4
Male	21	12	18	21	1	20	14	24	12	23	166
Female	7	7	13	11	7	7	5	8	11	11	87
Ward admission											
Mean age (Years)	39.7	40.1	31	36.8	33.6	34.3	29.1	38.1	40.7	40.6	36.4
Male	16	13	4	20	5	49	8	44	46	67	272
Female	7	8	-	7	3	15	3	17	20	36	116

Table 2: Demographics of lumbar spondylosis/spondylolisthesis cases.

Variables	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Out-patient clinics											
Mean age (Years)	56.6	55	54.5	51.3	54	53	52.4	54.4	53.6	56	54.1
Male	19	18	25	35	28	28	29	29	26	31	268
Female	42	32	35	35	33	43	42	43	38	41	384
Accident and emergency											
Mean age (Years)	50.7	50.4	54.4	54.2	49.4	54.5	52.9	51.5	54.3	53.9	52.6
Male	19	19	17	26	27	20	20	21	17	19	195
Female	29	20	27	25	29	39	28	21	23	16	257
Operating theatre											
Mean age (Years)	50	-	-	-	41	-	-	-	37	-	42.7
Male	-	-	-	-	-	-	-	-	-	-	-
Female	1	-	-	-	1	-	-	-	1	-	3
Ward admission											
Mean age (Years)	46.7	-	-	-	-	54	62	81	39.7	60.6	57.4
Male	-	-	-	-	-	2	-	1	3	10	16
Female	3	-	-	-	-	2	1	-	5	1	12

Table 3: Demographics of osteoarthritis cases.

Variables	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Out-patient clinics											
Mean age (Years)	58.5	55	53	59.6	52.7	50.9	57.4	55.2	53.8	53.1	54.9
Male	20	13	25	23	13	21	13	10	13	26	177
Female	24	26	28	42	45	29	31	26	30	37	318
Accident and emergency											
Mean age (Years)	56.8	57.4	59.4	52.2	57.5	57.3	50.3	58.3	53.4	60	50.3
Male	10	11	21	19	12	15	11	8	10	11	128
Female	20	14	17	19	31	25	20	12	15	16	189
Operating theatre											
Mean age (Years)	28.9	-	39.5	6	54.3	28.5	-	62.5	63	54	42.1
Male	3	-	2	1	4	3	-	1	-	1	15
Female	4	-	-	-	4	4	-	5	4	-	21
Ward admission											
Mean age (Years)	62.5	-	-	58.8	-	67.8	57	59.4	51	58.7	50.8
Male	-	-	-	4	-	3	1	5	2	3	18
Female	4	-	-	2	-	2	2	12	4	4	30

Table 4: Orthopedic cases seen at the accident and emergency department.

Types of case	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Trauma											
Dislocations	41	50	49	29	38	52	40	27	19	30	375
Fractures (RTA, falls, gunshot)	50	46	53	60	57	72	59	70	66	88	621
Infections											
Foot ulcer with sepsis/ cellulitis	31	45	41	56	37	23	41	33	30	37	392
Acute osteomyelitis	25	48	27	35	40	25	34	36	20	20	310
Degenerative diseases											
Lumbar spondylosis/ spondylolisthesis (LBP)	48	39	42	51	56	60	50	42	40	35	463
Osteoarthritis and other joint pain	67	78	61	78	83	87	60	64	78	55	864
Total	262	306	273	309	311	319	284	272	253	265	2854

Table 5: Orthopedic out-patient clinic cases.

Types of case	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Trauma											
Dislocations	24	14	21	25	26	20	25	22	21	50	227
Fractures (RTA, falls, gunshot)	53	30	29	20	48	39	49	37	71	184	560
Infections											
Limb/ foot ulcer with sepsis	14	10	11	10	-	13	14	12	15	16	115
Osteomyelitis	15	-	37	13	16	37	20	20	31	35	224
Potts disease	-	-	-	-	-	-	-	-	4	-	4
Bursitis	-	-	-	-	-	-	-	-	2	-	2
Congenital disorders/ defect at birth											
Polydactyly	-	-	6	-	-	-	-	3	5	12	26
Syndactyly	-	-	-	9	-	-	9	8	3	3	32
Talipes equino-valgus/ varus	11	4	10	8	-	17	2	2	13	15	82
Erb's palsy	-	-	1	1	-	1	1	-	1	-	5

Continued.

Types of case	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Metabolic/ degenerative diseases											
Gout	-	-	-	-	-	-	-	-	22	3	25
Blount's disease	-	6	10	16	3	4	9	7	3	11	69
Rickets	-	-	-	-	-	-	-	-	2	3	5
Osteoporosis	-	-	-	-	-	-	5	4	8	6	23
Osteoarthritis	44	39	42	40	58	50	44	51	93	194	655
Lumbar spondylosis/ spondylolisthesis	61	50	90	30	61	115	59	60	99	256	881
Degenerative bone disease	-	-	5	-	-	5	1	-	36	99	146
Carpal tunnel syndrome	-	-	-	-	-	-	-	-	-	2	2
Avascular necrosis of head of femur	-	-	-	-	-	-	-	-	-	8	8
Supraspinatus tendinitis	-	-	-	-	-	-	-	-	1	-	1
Scoliosis of thoracic spine	-	3	4	3	-	-	5	3	5	6	29
Bony exostosis	-	-	-	-	-	-	-	-	1	1	2
Ganglion	-	2	3	-	-	-	1	17	4	8	35
Plantar calcaneal spur	-	-	-	-	-	-	-	-	7	-	7
Neoplastic diseases											
Bone tumours	10	10	6	6	5	5	8	7	3	11	71
Post-burn contracture/ post operative complications/ post arthritic malformation											
Contracture of left wrist following burns	-	-	-	-	-	-	-	-	1	-	1
Genu valgum/ varus	-	-	2	-	-	2	-	1	9	23	37
Implant failure	-	-	-	-	-	-	-	-	2	2	4

Table 6: Orthopedic cases operated at the theatre.

Types of case	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Surgery for fractures	28	22	32	32	8	61	42	67	65	87	444
Amputation (for DM gangrene, trauma, burns)	-	4	-	-	-	4	21	8	8	11	56
Surgery for osteomyelitis	2	-	13	-	-	1	1	4	2	10	32
Manipulation of dislocated joint	8	7	4	8	-	8	7	5	1	8	56
Surgery for crush injury	-	-	-	-	-	3	-	4	-	2	9
Surgery for implant removal	-	-	-	-	2	5	1	1	1	15	24
Surgery for patellar ligament injury	-	-	-	-	-	-	-	-	-	2	2
Surgery for Blount's disease	1	4	5	2	-	2	11	4	2	7	38
Surgery for osteoarthritis	7	-	2	1	8	7	-	6	5	2	38
Surgery for talipes equinovarus	-	-	-	2	-	1	-	-	-	-	3
Surgery for bony exostosis	-	-	-	-	-	5	1	1	1	1	9
Surgery for septic arthritis	-	-	-	-	-	-	1	-	-	-	1

Continued.

Types of case	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Surgery for trigger finger	-	-	-	-	-	-	1	-	-	-	1
Release of left wrist contracture	-	-	-	-	-	-	-	-	1	-	1
Total knee arthroplasty	-	-	-	-	-	-	-	-	1	-	1
Wound debridement	1	-	-	-	-	1	-	-	-	-	2
Sprain	-	1	-	5	5	2	-	-	5	2	20
Bone tumours	8	16	9	8	8	3	6	6	10	7	81
Total											818

Table 7: Orthopedic admitted ward cases.

Types of case	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Trauma											
Dislocations	6	-	-	8	2	9	-	16	18	38	97
Fractures (RTA, falls, gunshot)	23	21	5	28	8	64	-	61	76	88	388
Sprain	1	-	-	1	-	-	-	1	2	5	10
Infections											
Osteomyelitis	-	1	-	1	1	1	-	-	-	-	4
Sepsis and debridement/gangrene	-	5	10	-	-	3	-	-	1	-	5
Metabolic/ degenerative diseases											
Osteoarthritis	4	-	-	5	-	5	3	17	6	-	28
Neoplastic diseases											
Bone tumours	16	26	12	16	15	8	12	11	13	14	143

DISCUSSION

Orthopedic surgical practice globally has moved from basic to include advanced practices featuring minimal invasive procedures with robotics in advanced climes.²⁸⁻³³ There are variations in scope of practice depending on availability of trained personnel and equipment. Almost three thousand orthopedic cases were recorded within the ten-year study period. Lumbar spondylosis/spondylolisthesis and osteoarthritis were the most prevalent orthopedic diseases encountered, presenting mostly as clinic cases. Next to osteoarthritis was fractures from multiple sources-road traffic accidents, falls, and gunshot injuries-mostly presenting as emergencies. Fractures from trauma has been known to be the commonest cause of amputations performed by orthopedic, general, vascular and trauma surgeons in our subregion.³⁴ The finding of predominance of fractures in our emergency orthopedic practice is also not surprising as the world health organization’s record has it that injuries account for 16% of the global burden of diseases, with 90% of the total burden coming from low and middle-income countries.^{35, 36}

Overall, majority of the patients who were seen in the out-patient clinics with fractures were females. This finding aligns with observations in the global epidemiology of fractures recorded more in females as

evidenced in previous studies.³⁷⁻³⁹ However, our experience from the records of the accident and emergency room, operating theatre, and wards shows predominance of males in the occurrence of fractures. However, this finding is without consideration of age variation. The explanation for this could be the bimodal distribution of fracture incidence, in which younger adult male population are known to sustain more fractures than females who dominate the older age group in fracture occurrence. The deduction here is that the male-folk in African setting is more engaged in outdoor economic, political and other activities to care for the family, and hence are more likely to sustain fractures that could have contributed to predominance of males in cases of fractures seen in the accident and emergency rooms, operating theatres, and ward admissions in our study. The overall mean age for fractures was 37.3 years, and also the younger mean ages in the emergency room, operating theatre and the wards seem to support this reasoning. This finding is in agreement with reports from other centers in Nigeria.^{24, 40}

Lumbar spondylosis/spondylolisthesis was seen more among females, with overall mean age of 51.7 years. This finding is in agreement with the reports of other researchers.⁴¹⁻⁴³ Influence of oral contraceptives, pregnancy and parturition, and menopause have been reported to contribute to this picture. However, the mean

age recorded in our study appears younger than those seen in previous reports. The number of osteoarthritis recorded among females was almost double that of males, and the overall mean age for osteoarthritis was 49.5 years. This finding is in agreement with the reports of researchers from other climes, as osteoarthritis is known to be commoner in females and usually after the age of fifty.⁴⁴⁻⁴⁶ A report from Cameron in Africa has some commonality with our study.⁴⁷ Our finding is also similar to the findings of other research works from other centers in Nigeria, although the mean age for osteoarthritis in our study appears a little lower in our study.⁴⁸⁻⁵⁰

Operation for fractures comprise more than half of the bulk of surgical workload of the orthopedic surgeon in our center. This was closely followed by manipulations for joint dislocations. This may be as a result of the fact that this State-administered center recently upgraded to a teaching hospital status, was mainly functioning as a State specialist hospital and referral center for the general hospitals in the local governments areas in Rivers State. There was no super-specialization among the orthopedic team, hence the absence of some operative surgical procedures seen in other climes. It is also for the same reason that orthopaedic ward bed occupancy was largely due to fractures, followed by bone tumours and dislocations. It is hoped that the upgrade coupled with further training of staff and provision needed equipment will lead to super-specialization within the orthopedic team, and subsequent improvement in the pattern of cases to advanced surgeries.

CONCLUSION

About three thousand orthopedic cases were within the ten-year study period, with lumbar spondylosis/spondylolisthesis and osteoarthritis dominating the outpatient orthopedic clinic care. Trauma-related disease care constitutes the bulk of work of the orthopedic surgeon in our environment in the emergency room, operating theatre and ward admissions, and younger males were more affected.

Recommendations

Establishment of a trauma registry in Port Harcourt will go a long way to track trauma cases for research and planning, knowing that trauma/fractures account for the bulk of emergency practice in our environment. Upgrading the trauma care services at the study centre will go a long way to reduce the morbidity and mortality that could be associated with this burden of disease. Further training of staff for super-specialization is needed for a more robust orthopaedic practice.

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