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EVALUATION OF THE RECURRENCE OF CHILDHOOD FRACTURE TRAUMA IN THE ELDERLY, USING NATIONAL ORTHOPEDIC HOSPITAL, ENUGU.

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ABSTRACT

Background: Fractures are common during childhood and constitute 10 – 25 % of pediatric injuries. Fracture rate appears to be increasing over time and is commonly caused by osteoporosis, overuse and trauma from a fall, motor vehicle accident or tackle during sports. Materials and Methods: The research investigates prevalence, etiology and factors associated with recurrent fracture in this specific population. The study utilizes a purposive sampling technique to select individuals aged 50 and above with a documented history of childhood fracture trauma. Data is collected from medical records. Variables include demographic characteristics, medical history. Statistical analysis was used to explore relationships and identify factors influencing recurrent fracture. Results: Preliminary findings reveal a nuanced understanding of factors contributing to recurrent fracture, the analysis showed that 46.7% of the respondents had two recurrent fractures after their first fracture and were aged 60-69years. 53.3% of the respondents were female. The results showed that the most commonly fractured bones were bones of the upper and lower limb with equal percentage 40%. Major etiology of fracture in both initial fracture and final fracture is trauma with 53.3% and 76.7% respectively. This research contributes to the limited literature on the recurrence of childhood fracture trauma in the elderly. The findings aim to guild health care professionals in fracture management.

Key words: Bones, recurrent fracture, Trauma, osteoporosis

INTRODUCTION

Recurrent fractures in adults remain a major clinical challenge, particularly in aging populations. Individuals aged 60 years and above have been shown to exhibit the highest recurrence rates of fractures, likely due to age-related bone loss and comorbidities (Kanis et al. 2020). Fracture history is a strong predictor of subsequent fractures, and studies have confirmed that adults with prior fractures are significantly more likely to sustain future breaks, especially within 1 to 2 years after the first event (Johansson et al. 2022). Moreover, the burden of fracture recurrence increases healthcare costs and contributes to reduced quality of life in this age group (Curtis et al. 2023).

Interestingly, many individuals with recurrent fractures sustained their initial fracture before the age of 25, emphasizing the long-term implications of early skeletal trauma (Jones et al. 2005). A previous study reported that children and adolescents who experienced one fracture had nearly twice the risk of subsequent fractures, and the risk tripled after a second fracture (Jones et al. 2005). This cumulative fracture risk continues into adulthood, suggesting that early bone injuries may impair future bone integrity or reflect underlying skeletal fragility (Cooper et al. 2021). These findings underscore the need to consider fracture history even from childhood in fracture prevention strategies across the lifespan (Cooper et al. 2021).

The anatomical site and initial management of the fracture are also crucial determinants of recurrence. Fractures involving the upper and lower limbs, especially the forearm, femur, and tibia, have shown higher recurrence rates (Curtis et al. 2023). A study evaluating treatment patterns found that suboptimal or delayed care particularly lack of anti-osteoporotic therapy or rehabilitation significantly increased the likelihood of refracture (Chen et al. 2015). Furthermore, inadequate stabilization or misalignment during initial treatment has been linked to persistent biomechanical weaknesses and higher risk of refraction at the same site (Chen et al. 2015). These observations highlight the critical role of timely

and appropriate fracture management in preventing recurrence.

MATERIAL AND METHODS

The study was carried out at the National Orthopaedic Hospital, Enugu, and involved a total number of 30 patients, comprising of 14 (46.7%) males and 16 (53.3%) females, aged 50years and above with a documented history of childhood fracture trauma in. The sample population of this study were patients with recurrent fracture from physiotherapy and orthopedic department in National Orthopedic Hospital. The patients were interviewed and their data retrieved from their hospital folders. Data analysis was done using the Statistical Package for the Social Sciences (SPSS) (International Business Machines (IBM), United States) Statistics v.23 package, means and *P value* < 0.05 was taken to be significant.

Enugu Metropolis is characterized by a diverse population with varying socioeconomic backgrounds. It is an urban center with access to advanced medical facilities, including National Orthopaedic Hospital, Enugu.

The study population were fracture patients from physiotherapy and orthopedic department in National Orthopedic Hospital Enugu.

The inclusion criteria for participants were as follows

- Must be aged 50 and above
- Diagnosed with bone refracture
- A past or present patient from National Orthopedic Hospital Enugu
- Must have accessible medical records

Participants were excluded from the study if they met any of the following criteria;

- Patients aged below 50
- Unavailability of complete medical records
- Patients that are not from the selected medial institute

Results

Table 1 Demographic characteristics of the respondents n= 30

Variables	Parameter	Frequency%	Mean (Sd)
Age	50-59	6(20.7%)	2.2 (0.846)
	60-69	14 (46.7%)	
	70-79	8 (26.7%)	
	80 & above	2 (6.7%)	
Sex	Male	14 (46.7%)	1.53(0.507)
	Female	16 (53.3)	
Tribe	Igbo	19(63.3%)	1.76(1.165)
	Yoruba	4(13.3%)	
	Hausa	2(6.7%)	
	Others	5(16.7%)	
Age of first fracture	<25	20(66.7%)	1.33(0.479
	<50	10(33.3%)	

A total number of 30 questionnaires were used. Results showed that majority (46.7%) of the respondents were aged from 60-69years while 53.3% of the respondents were female. Also, majority (63.3%) of the respondents were Igbos and 66.7% of the respondents age of first fracture were < 25years.

Table 2: To determine the prevalence of recurrent childhood fracture trauma in the elderly.

Variables	Parameter	Frequency%	Mean (Sd)
Number of times of refracture	Once	10(33.3%)	1.867(0.73)
	Twice	14(46.7%)	
	More than twice	6(20%)	

From the Table above, majority (46.7%) of the respondents had two recurrent of fracture prior to their first fracture.

Table 3: To identify factors influencing the recurrence childhood fracture in elderly

Variables	Number of Time of Refracture			
	B	S. E	T	P
Age	0.148	0.223	0.662	0.759
Sex	0.224	0.411	0.546	0.516
Tribe	0.101	0.192	0.527	0.592
Age of First Fracture	0.383	0.428	0.895	0.605
Type of Fracture	0.361	0.268	1.348	0.189
Fractured Bone	0.016	0.225	0.071	0.042
Initial Treatment	0.082	0.341	0.057	0.026
Treatment and Other Times	0.200	0.352	0.569	0.576
Last Treatment	0.718	0.419	1.715	0.103
Initial Etiology	0.134	0.172	0.779	0.445
Final Etiology	0.101	0.217	0.463	0.649

The dependent variable (number of times of re fracture was regressed on predicting variables of age, sex, tribe, age of first fracture, type of fracture, fractured bone, initial treatment, treatment at other times, initial and final etiology. The table shows various independent variable influences the number of times of re fracture. Among them, only fractured bone and initial treatment were of significant influence.

Table 4: To assess the prevalence of etiology of bone fracture

Variables	Parameter	Frequency%	Mean (Sd)
Initial Etiology	Trauma	16(53.3%)	1.86(1.07)
	Osteoporosis	5(16.7%)	
	Overuse	6(20%)	
	Others	3(10%)	
Final Etiology	Trauma	23(76.7%)	1.86(1.07)
	Osteoporosis	4(13.3%)	
	Overuse	1(3.3%)	
	Others	2(6.7%)	

From the table above, majority (53.3 % and 76.7%) of the respondent etiology of fracture is trauma in both initial and final etiology of fracture.

Table 5: To assess the most commonly fractured bone

Variables	Parameter	Frequency%	Mean (Sd)
Fractured Bones	Bones of the upper limb	12 (40%)	2.0 (0.9097)
	Bones of the lower limb		
	Hip Bone	6 (20%)	
		12 (40%)	

The result showed the most common fractured bone were bones of the upper limb and lower limb with equal percentage (40%).

DISCUSSION

The findings of this study underscore the multifactorial nature of recurrent fractures in adults. The highest recurrence rate among individuals aged 60–69 aligns with existing literature, which associates increased age with reduced bone density, increased fall risk, and comorbidities (Kanis et al. 2020). The observation that most participants had their first fracture before the age of 25 suggests that early-life skeletal trauma is a significant predictor of later-life fracture recurrence (Jones et al. 2005). Prior studies have shown that childhood and adolescent fractures can double or triple the risk of future fractures, reflecting potential underlying skeletal fragility or insufficient bone recovery (Jones et al. 2005; Cooper et al. 2021). The upper and lower limbs were the most commonly fractured and refractured regions, consistent with previous research identifying these locations as bearing the brunt of mechanical stress and falls (Curtis et al. 2023). The predominance of recurrence occurring twice is indicative of a progressive vulnerability, as each fracture increases the likelihood of subsequent injury (Johansson et al. 2022). Furthermore, both the site of the initial fracture and the nature of its treatment significantly influenced the likelihood of recurrence, with inadequate management contributing to biomechanical instability and prolonged healing (Chen et al. 2015).

CONCLUSION

This study concludes that recurrent fractures in adults are most prevalent among individuals aged 60–69 and are influenced by a history of early fractures, the anatomical site involved, and the adequacy of initial treatment. The long-term implications of early fractures emphasize the importance of monitoring bone health from a young age (Jones et al. 2005). The fact that upper and lower limb fractures are most commonly recurrent aligns with their susceptibility to mechanical loads and trauma (Curtis et al. 2023). Poor or delayed initial treatment remains a significant risk factor for refracture, further underscoring the importance of early clinical intervention (Chen et al. 2015). These findings highlight a need for improved strategies to predict, prevent, and manage fractures across the lifespan.

RECOMMENDATION

It is recommended that healthcare systems implement targeted screening for individuals with a history of childhood or adolescent fractures to enable early intervention and reduce long-term fracture risk (Cooper et al. 2021). Preventive measures, such as bone mineral density assessments, fall prevention programs, and lifestyle interventions that promote bone health, should be prioritized, especially for those entering their sixth decade of life (Kanis et al. 2020). Clinical protocols should ensure optimal management of the initial fracture through proper stabilization, timely surgery if indicated, and long-term follow-up with bone-strengthening therapies (Chen et al. 2015; Curtis et al. 2023). Policy makers should also consider expanding access to osteoporosis medications and post-fracture rehabilitation services to mitigate recurrence and improve quality of life (Johansson et al. 2022).

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