



## SOCIODEMOGRAPHIC PROFILE AND PATTERN OF SINONASAL INJURIES AT THE EKITI STATE UNIVERSITY TEACHING HOSPITAL, ADO-EKITI, SOUTH-WEST NIGERIA

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### ABSTRACT

**Background:** Sinonasal trauma is a common otorhinolaryngology disorder worldwide.

This study aimed at determining the prevalence, sociodemographic features, aetiology, clinical presentation, management and outcome of injuries to the nose and paranasal sinuses.

**Materials and Methods:** This was a prospective study of patients with sinonasal injuries that presented at our tertiary health institution. Consented patients were studied between October 2015 and September 2017. Analysis of obtained data was done with SPSS version 16.0.

**Results:** The prevalence of sinonasal injury was 2.7%. There were 67.1% males and 32.9% females with male to female ratio of 2:1. Foreign body was the commonest cause of injury in 35.4% followed by road traffic accidents in 24.4%. Commonest anatomical region of sinonasal injury were nasal cavity and nasal vestibule in 57.3% and 19.5%. Common clinical features among the patients were pain in 72.0%, bleeding in 53.6% and foreign bodies impaction in 35.4%. Acute sinonasal injury in 95.1% was commoner than chronic sinonasal injury ( $\geq 13$  weeks) in 4.9%. Commonest associated complications of the sinonasal injuries were rhinosinusitis in 37.8% others were 22.0% epistaxis, 11.0% nasal septal abscess and 3.7% adhesion. Pre-hospital treatment in the patients was 62.2%. Major treatments offered to the patients were conservative/medical therapy in 53.7%. Commonest surgical interventions were 35.4% foreign body removal and 7.3% epistaxis control.

**Conclusion:** Sinonasal injuries are common in the otorhinolaryngology practice. Commonest causes are self-inflicting foreign bodies impaction and road traffic accident. Pre-hospital treatment in the patients was very high.

### INTRODUCTION

Sinonasal trauma is a scientific study of injuries caused by external sources and its management in otorhinolaryngology practice. Sinonasal injuries are common in clinical practice and constitute a significant cause of avoidable morbidity and mortality<sup>1-4</sup>. This is because nose is most prominent organ in the face. It is highly important to note that otorhinolaryngology trauma has lead to varying degrees of socioeconomic, physical, functional and cosmetic disability on the sufferers<sup>5,6</sup>. Because it occupied middle third of face, the deformity is easily noticed.

The incidence of ear, nose and throat trauma had been reported to range between 5.0– 15.0%

in developing<sup>4,7</sup>. Otorhinolaryngology trauma mostly nose occur in all age groups; however the causes differ between children and adults worldwide<sup>3,8</sup>.

Sinonasal injuries in developing countries are different from those in well developed and industrialized countries<sup>9</sup>. The injuries vary with age, sociodemographic status and geographic distribution<sup>10</sup>. The trauma is common and tends to occur more frequently with serious complications like upper airway embarrassment among the presenting patients<sup>11</sup>. Common pathological trauma includes foreign bodies impaction, road traffic accident, assaults, falls and sports<sup>3,4,7</sup>. Otorhinolaryngology injuries to the nose and sinuses can occur as an isolated injury or

may be comorbid with injuries to other anatomical regions such as chest, abdominal, spinal and extremities<sup>11,12</sup>.

Sinonasal trauma may be blunt trauma, penetrating, lacerations, partial or total avulsion injury and fracture facial bones. Blunt traumas such as blows from law enforcement agents or senior/boss or penetrating trauma due to gun shot or broken bottle from violence/assault are very common in developing country<sup>13</sup>.

Clinical presentation of facial trauma may be frightening to patients, life threatening and present as emergency. This is when there is associated pain, bleeding, airway embarrassment and foreign bodies impaction in children<sup>14,15</sup>. Otorhinolaryngology, head and neck presentation includes history of trauma, foreign bodies impaction, pain, bleeding, nasal blockage, olfaction disorder and difficulty breathing.

Sinonasal injuries occur most frequently in children and most times first present to the untrained personnel at home, an unskilled health worker or family doctors. It poses a challenge to the Otorhinolaryngologist when tampered with leading to complications which require hospitalization<sup>16,17</sup>. Their efforts may lead to further trauma, bleeding, and further damages.

Morbidity and mortality associated with otorhinolaryngology trauma is a significant and neglected disorder in Sub Saharan Africa. There are few literature reports on this subject in developing country with enormous increase in the number of patients with these disorders. There is need to increase the level of awareness on sinonasal injuries to non specialist. This study aimed at determining the sociodemographic features, aetiology, clinical presentation, management and outcome of injuries to the nose and paranasal sinuses.

## MATERIALS AND METHODS

This was a prospective hospital based study of all patients who presented and were managed between October 2015 and September 2017 on account of sinonasal trauma in the accident & emergency department, ENT wards and clinics of Ekiti State University Teaching Hospital, Ado Ekiti.

This is the only state own tertiary hospital located in Ado Ekiti, the Ekiti state capital in the southern belt zone of Nigeria, sub-servicing about five states namely Kwara, Kogi, Osun, Ekiti and Ondo states. Department of Ear, Nose and Throat is one of the hospital departments with services covering the above mentioned zones in terms of patients' coverage.

Consented patients were enrolled into the study. Unstable ones were resuscitated, treated and admitted pre and post procedures for close

monitoring. Stable patients were treated as out-patients.

Data that were obtained includes the age, sex, presenting complaints; duration of symptoms prior to presentation, diagnoses, treatments and complications. Ear, nose, throat, head and neck finding were documented. The obtained data was done by pretested questionnaire.

Analysis of obtained data was done with SPSS version 16.0 computer software. The data were expressed with frequency tables, percentage, pie charts and bar charts.

Ethical clearance to carry out this study was sought for and obtained from the institution.

## RESULTS

During this study period a total of 3049 patients were seen in ear, nose and throat department. Out of which a total of 82 patients had complaints of sinonasal injuries. The prevalence of sinonasal injury was 2.7%.

Sinonasal injury occurred in all the studied age groups. Highest prevalence was 31 (37.8%) and peaked at first decade, 1-10 years. Table 1 illustrated the age group distribution of patients.

There were 55 (67.1%) males and 27 (32.9%) females with male to female ratio of 2:1. Urban resident patients accounted for 48 (58.5%) while rural resident accounted for 34 (41.5%). Commonest affected educational level were primary and secondary level in 29 (35.4%) and 24 (29.3%) respectively. Others were preschool in 17 (20.7%) and post secondary in 12 (14.6%). On patient's occupation, commonest were students/apprentice in 27 (32.9%) these were followed by driver in 16 (19.5%). Table 1 demonstrated sociodemographic features of patients.

Foreign bodies was the commonest cause of injury in 29 (35.4%) followed by road traffic accidents in 20 (24.4%). Other causes were nose picking and fall in 11 (13.4%) and 7 (8.5%). This is demonstrated illustrated in table 2.

Commonest anatomical region of sinonasal injury were nasal cavity and nasal vestibule in 47 (57.3%) and 16 (19.5%). This is showed in figure 1.

The most common clinical features among the patients were pain in 59 (72.0%), bleeding in 44 (53.6%) and foreign bodies impaction in 29 (35.4%). Other clinical findings were 14 (17.1%) referred otalgia, 13 (15.9%) facial swelling and 12 (14.6%) lacerations. This is showed in table 3.

Acute sinonasal injury in 78 (95.1%) were commoner than chronic sinonasal injury ( $\geq$  13 weeks) in 4 (4.9%). Commonest acute sinonasal injury were (1-4) weeks in 67 (81.7%) and (5-8) weeks in 9 (11.0%). This is illustrated in figure 2.

Commonest associated complications of the

sinonasal injuries were rhinosinusitis in 31 (37.8%) others were 18 (22.0%) epistaxis, 9 (11.0%) nasal septal abscess and 3 (3.7%) adhesion. This is demonstrated in table 4.

Pre-hospital treatment in the patients was 51

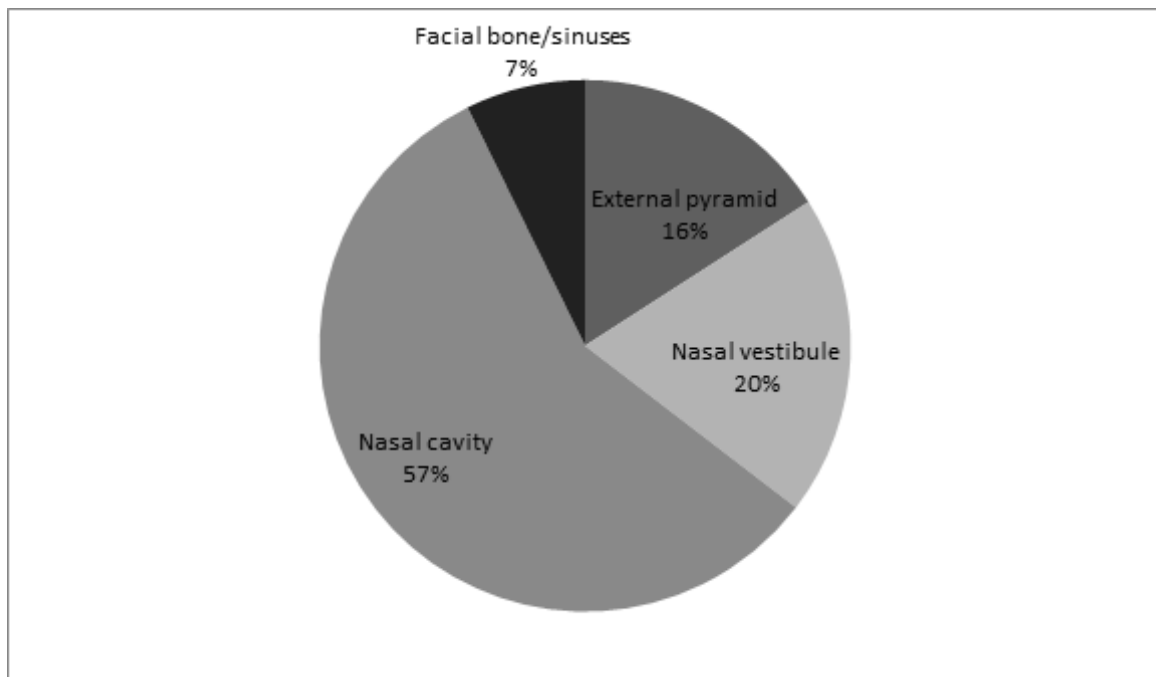
(62.2%). Major treatments offered to the patients were conservative/medical therapy in 44 (53.7%). Commonest surgical interventions were 29 (35.4%) foreign body removal and 6 (7.3%) epistaxis control. The detailed is showed in table 5.

Table 1 Sociodemographic features of patients with sinonasal injury

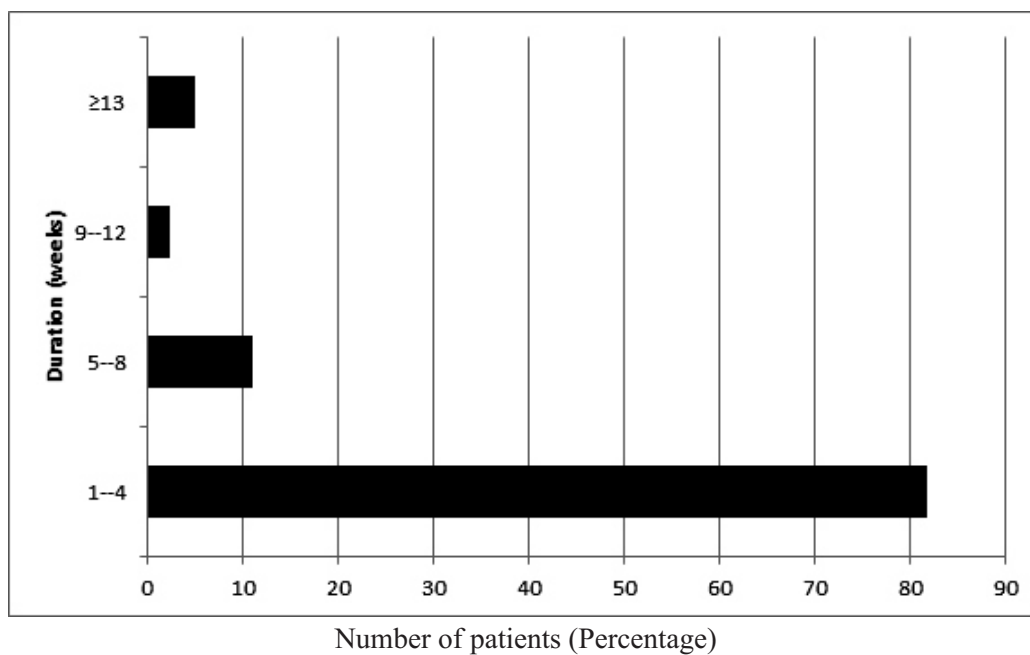
Sociodemographic features	Number	Percentage (%)
<b>Age group (year)</b>		
1-10	31	37.8
11-20	16	19.5
21-30	18	22.0
31-40	5	6.1
41-50	7	8.5
51-60	4	4.9
≥61	1	1.2
<b>Sex</b>		
Male	55	67.1
Female	27	32.9
<b>Residential</b>		
Urban	48	58.5
Rural	34	41.5
<b>Education level</b>		
Preschool	17	20.7
Primary	29	35.4
Secondary	24	29.3
Post secondary	12	14.6
<b>Patients occupation</b>		
Student/Apprentice	27	32.9
Applicant	9	11.0
Business	3	3.7
Driver	16	19.5
Industrial worker	8	9.8
Farming	7	8.5
Artisans	12	14.6

Table 2. Aetiology of sinonasal injury among the patients

Aetiology	Number	Percentage (%)
Foreign bodies	29	35.4
Road traffic accidents	20	24.4
Falls	7	8.5
Assault	4	4.9
Burns	2	2.4
Iatrogenic	5	6.1
Nose picking	11	13.4
Penetrating injury	1	1.2
Slap	3	3.7
	82	100.0

**Figure 1.** Anatomical distribution of sinonasal injury among the patients**Table 3.** Clinical features of sinonasal injury among the patients

Anatomical distribution	Number	Percentage (%)
Foreign body insertion	29	35.4
Pain	59	72.0
Headache	21	25.6
Referred otalgia	14	17.1
CSF rhinorrhea	5	6.1
Facial swelling	13	15.9
Lacerations	12	14.6
Bleeding	44	53.6
Burns	2	2.4

**Figure 2.** Symptoms duration of sinonasal injury among the patients

**Table 4.** Associated complications of sinonasal injury among the patients

Associated complications	Number	Percentage (%)
Rhinosinusitis	31	37.8
Epistaxis	18	22.0
Nasal septal abscess	9	11.0
Adhesion	3	3.7
Nasal deformity	2	2.4

**Table 5.** Treatment of sinonasal injury among the patients

Treatment	Number	Percentage (%)
Pre-hospital intervention	51	62.2
Conservative treatment	44	53.7
Foreign body removal	29	35.4
Surgical wound debridement	5	6.1
Epistaxis control	6	7.3
Airway management	3	3.7
Rhinoplasty	3	3.7
Fracture management	2	2.4

\*NB: Some patients received more than one treatment

## DISCUSSION

This study of sinonasal trauma revealed the prevalence to be 2.7%. Despite under reported in the literature sinonasal injuries are still very common among otorhinolaryngology patients. This finding is similar to report from previous study<sup>18</sup>.

There is high prevalence of sinonasal injuries among children, male, urban dwellers and students in this study. There is increased in bodily activities which may predispose them to both indoor and outdoor injuries from road traffic accident, assault, foreign bodies and so on<sup>19</sup>. High prevalence of nasal injury in the studied patients was due to rampart exploration of the head and neck orifices among the individual.

Foreign body in the sinonasal injuries constituted the leading causes in this study. The presentation depends on the anatomical site and nature of the foreign body. This finding is in accordance with report from other study<sup>15</sup>.

Duration of illness at presentation depends on the anatomical site, nature of object and associated symptoms. Majority of the studied patients presented as an acute case while minority presented after three months. This may be due to associated high prevalence bleeding and pain in the studied patients. This findings is similar to report from previous studies<sup>7,8</sup>. It is important to note that late presentation may be attributed to self-treatment at home, pre-hospital consultation with traditional healers, delayed in referral from private and public clinics, dispensaries and health centers, and transport costs<sup>20</sup>. Complications from delayed

presentation following trauma may increases the likelihood of further complications, prolonged hospital stay, as well as death.

Commonest complaint was pain, epistaxis, foreign bodies' insertion, and headache and referred otalgia. Referred earache occurred on the sinonasal pathology as in previous studies<sup>21,22</sup>. Second most common features were bleeding from the nose which may arises from the pathology or pre-hospital unskilled intervention. Pre-hospital care of patient is an important factor determining the ultimate outcome of specialist after care of the injury<sup>23,24</sup>.

In this study, presence of complications has an impact on the duration of presentation, presented features and final outcome of specialist treatment. The pattern of complications in this study includes traumatic epistaxis and nasal septal abscess. This pattern of complications are similar to what was reported by others studies<sup>7,11</sup>.

Majority of the patients with sinonasal trauma had pre-hospital treatment from unskilled sympathizers which includes parents, friends and neighbors. These interventions rather worsen patients' conditions. In this study all the unstable patients were resuscitated, stabilized and subsequently treated conservatively/medically by wound dressing, antibiotics, nasal decongestant and analgesic. Facial bone fractures with CSF rhinorrhea were conservatively co-managed with trauma and neurosurgical team. Foreign bodies were aseptic and atraumatic removed. Wound debridement was done on infected dirty wound. Rhinoplasty and further surgical intervention were performed where

indicated with satisfactory outcomes. This sinonasal injuries management outcome is similar to other studies<sup>25,26</sup>.

### CONCLUSION

Sinonasal injuries are common in otorhinolaryngology practice. They arise from self-inflicting nasal foreign bodies' insertion and road traffic accident. Health education on danger of safe driving with construction of good road and danger from pre-hospital intervention are advised. Safe otorhinolaryngology care and early referral of difficult cases to otorhinolaryngologist for expert care to prevent avoidable morbidity and mortality is advised.

### Implications of sinonasal injury to policy maker

1. Effort must be put in place to reduce the prevalence e.g by reducing road traffic accident nation wide
2. Increase level of awareness inform of advocacy at various level of government ( i.e at Local, State and Federal)
3. To increase evenly distribution of specialist in this field (i.e ENT Surgeon, Oral & Maxillo Facial Surgeon, Ophthalmologist, Plastic & Aesthetic Surgeon and Neuro Surgeon)
4. Universal health coverage must be a reality
5. Strengthening the Primary and Secondary levels of health care

### Implications for clinical practice

1. Establishing a standard diagnostic guidelines ( i.e Radiological and various relevant Imaging techniques)
2. Training of community health workers first aids and to stressed the need to make early referral of difficulty sino nasal injury(ies)
3. To ensure adequate equipment in the hospitals
4. Strengthening the Primary and Secondary levels of health care

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### COMPETING INTERESTS

All the authors declare that there was no competing interests..

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