eISSN 2255-0569

ORIGINAL

Gender-based evaluation of haematological and some inflammation markers in patients with mandibular fracture in a tertiary Hospital in southeast, Nigeria

Evaluación basada en el género de los marcadores hematológicos y de inflamación en pacientes con fractura mandibular en un Hospital terciario del sureste de Nigeria

Emmanuel Ifeanyi Obeagu[1], Pilar Tomás-Gil[2], Josep Lluis Coll Villalonga[2], Pau Martí-Lliteras[3], Getrude Uzoma Obeagu[3,4]

1. Department of Medical Laboratory Science, Kampala International University, Western Campus, Ishaka, Uganda.
2. ADEMA-Health Group. IUNICS. University of Balearic Islands. Spain
3. Department of Nursing Services, National Orthopaedic Hospital, Enugu, Enugu State, Nigeria.
4. Department of Nursing Science, Ebonyi State University, Abakaliki, Ebonyi State, Nigeria.

Corresponding author
Emmanuel Ifeanyi Obeagu
E-mail: emmanuelobeagu@yahoo.com

Received: 28 - XII - 2022
Accepted: 15 - III - 2023

doi: 10.3306/AJHS.2023.38.03.59

Abstract

Aim: The study was done to evaluate hematological parameters and some inflammatory markers in patients with mandibular fractures in a tertiary hospital in Southeast, Nigeria.
Methods: A total of 100 subjects were selected for the study comprising of 50 patients with mandibular fracture and 50 apparently healthy individuals attended National Orthopedic Hospital, Enugu, Nigeria. About 3ml of venous blood was collected from antecubital fossa following aseptic techniques into EDTA containers for FBC determinations. The full blood counts of the subjects were determined using Mlndray BC-3000 Plus. The data were analyzed using student t-test and present as mean ± standard deviation using SPSS version 20 and level of significance set at P<0.05.
Results: The study showed increase in the red lines such as the red cells, hemoglobin and Packed Cell Volume of the male compared to the females.
Conclusions: The society are advised to minimize some activities that will predispose them to mandibular factures as there are limited surgeons with expertise in this part of the world to resolve the issues fast and with utmost well-being of the patients.

Key words: Gender, haematological parameters, inflammation, mandibular fractures.

Resumen

Objetivo: El estudio se realizó para evaluar los parámetros hematológicos y algunos marcadores inflamatorios en pacientes con fracturas mandibulares en un hospital terciario del sureste de Nigeria.
Material y métodos: Se seleccionó un total de 100 sujetos para el estudio, compuesto por 50 pacientes con fractura mandibular y 50 individuos aparentemente sanos que acudieron al Hospital Ortopédico Nacional de Enugu (Nigeria). Se extrajeron unos 3 ml de sangre venosa de la fosa antecubital siguiendo técnicas asépticas en recipientes con EDTA para las determinaciones del hemograma. Los recuentos sanguíneos completos de los sujetos se determinaron utilizando el Mlndray BC-3000 Plus. Los datos se analizaron mediante la prueba de la t de Student y se presentaron como media ± desviación estándar utilizando el SPSS versión 20 y el nivel de significación se fijó en P<0,05.
Resultados: El estudio mostró un aumento de los glóbulos rojos, la hemoglobina y el volumen celular empaquetado de los hombres en comparación con las mujeres.
Conclusiones: Se aconseja a la sociedad que reduzca al mínimo algunas actividades que le predispongan a sufrir fracturas mandibulares, ya que en esta parte del mundo hay pocos cirujanos con experiencia para resolver los problemas rápidamente y con el máximo bienestar de los pacientes.

Palabras clave: Género, parámetros hematológicos, inflamación, fracturas mandibulares.

Introduction

It has been reported that the incidence of maxillofacial fracture varies with population density, living environment, socioeconomic status, and road traffic conditions[1-5]. It has been opined that most cases of maxillofacial trauma involve mandibular fracture, which is usually managed by departments of oral and maxillofacial surgery[6].

The number of elderly patients with maxillofacial trauma has increased in recent decades because of changes in lifestyle and an increase in the proportion of elderly patients in the population[1]. Likewise, in other developed countries, the proportion of individuals ≥65 years of age is expected to increase to 26.2%. With demographic and various social changes, such as the greater number of elderly living alone and leading an active retirement, the elderly population may be at increased risk for trauma, including maxillofacial fracture[7].

It has been shown that vehicular accidents and altercations are the primary causes of mandibular fractures throughout the world. In an urban trauma setting, altercations account for most fractures (50%), and motor vehicle accidents are less likely (29%). Gender-based report has shown that Males suffer approximately three times as many mandible fractures as females, with the majority occurring in the third decade of life[8,9]. Patients with mandibular fractures frequently have other associated injuries (43%). The most common associated injuries include head injuries (39%), head and neck laceration (30%), midface fractures (28%), ocular injuries (16%), nasal fractures (12%), and cervical spine fractures (11%)[8].

The study was done to evaluate the hematological parameters and some inflammation marker of patients with mandibular fractures in a tertiary hospital in Southeast, Nigeria.

Materials and methods

Study area

The study was done in National Orthopedic Hospital, Enugu, Nigeria. This hospital is located in in Enugu State in Nigeria. The hospital serves many people from all over Nigeria with Orthopedic cases.

Study Design

The study adopted cross-sectional hospital based design with purposive sampling technique where patients who attended the hospital with mandibular fractures were selected for the study and the hematological parameters and some inflammation markers were evaluated with the apparently healthy individuals who attended the hospital on other issues not for disease issues.

Subjects

A total of 100 subjects were selected for the study comprising of 50 patients with mandibular fracture and 50 apparently healthy individuals attended National Orthopedic Hospital, Enugu, Nigeria.

Ethical issues

Ethical approval was obtained from the institution and informed consent obtained from the subjects. The details of the study were fully explained to the subject before they gave their consent and they willing participated in the study and confidentiality assured to them.

Blood Collection and Laboratory Investigations

About 3ml of venous blood was collected from antecubital fossa following aseptic techniques into EDTA containers for FBC determinations. The full blood counts of the subjects were determined using Mlndray BC-3000 Plus.

Data analysis

The data were analyzed using student t-test and present as mean ± standard deviation using SPSS version 20 and level of significance set at $P<0.05$

Results

Table I: Hematological and some inflammation markers of patients with mandibular fracture and apparently healthy subjects.

Parameters	Male	Female	P-value
RBC (X1012/L)	3.67±0.13	3.24±0.14	0.001*
Hemoglobin (g/dl)	11.00±0.41	9.74±0.43	0.001*
PCV (%)	32.40±1.14	29.20±1.30	0.003*
Platelets (X109/L)	268.00±14.30	267.60±8.73	0.959
WBC (X109/L)	6.46±0.68	6.56±0.36	0.778
Neutrophils (%)	65.40±5.73	66.80±2.59	0.632
Lymphocytes (%)	26.94±5.18	25.62±2.38	0.619
Eosinophils (%)	0.66±0.84	0.38±0.08	0.519
Monocytes (%)	7.00±1.87	7.2±1.64	0.862
NLR	2.55±0.79	2.63±0.35	0.830
PLR	10.38±2.92	10.52±1.08	0.925

RBC= Red blood cell, PCV= Packed cell volume, WBC= Total white cell count, NLR= Neutrophil to lymphocyte ratio, PLR= Platelet to lymphocyte ratio

Discussion

The study showed increase in the red lines such as the red cells, hemoglobin and Packed Cell Volume of the male compared to the females. The red cell lines of males are usually higher due to hormonal differences and menstrual cycles of the females. It was noticed that there was no changes in the white cell line and platelets together with the inflammatory markers which indicates that inflammation in patients with mandibular fractures are not gender based. The red cell lines of the patients with mandibular fractures may be affected due to the impact on the bone marrow which may affect the hematopoietic activities of the bone marrows. This will have a serious effect on the survival of the patients

as some of them may be likely anemic due to bone marrow reduced activities. It has been reported that mandibular factures are more prevalent in men than in women which may be due to nature of works men are predisposed to in Nigeria to keep their families viable financially and otherwise[8,9]. It was also reported that mandibular fractures are more common in the aging and the elderly[7]. The society are advised to minimize some activities that will predispose them to mandibular factures as there are limited surgeons with expertise in this part of the world to resolve the issues fast and with utmost well-being of the patients.

Conclusion

The study showed increase in the red lines such as the red cells, hemoglobin and Packed Cell Volume of the male compared to the females. The society are advised to minimize some activities that will predispose them to mandibular factures as there are limited surgeons with expertise in this part of the world to resolve the issues fast and with utmost well-being of the patients.

Conflict of interest

None

References

1. Goldschmidt MJ, Castidlione CL, Assael LA, Litt MD. Craniomaxillofacial trauma in the elderly. *J Oral Maxillofac Surg.* 1995;53: 1145-9.

2. Brasileiro BF, Passeri LA. Epidemiological analysis of maxillofacial fractures in Brazil: a 5-year prospective study. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 2006;102: 28-34.

3. Bakardjiev A, Pechalova P. Maxillofacial fractures in Southern Bulgaria—a retrospective study of 1706 cases. *J Craniomaxillofac Surg.* 2007;35: 147-50.

4. Maliska MC, Lima SM Júnior, Gil JN. Analysis of 185 maxillofacial fractures in the state of Santa Catarina, Brazil. *Braz Oral Res.* 2009;23: 268-74.

5. Kloss FR, Stigler RG, Brandstätter A, Tuli T, Rasse M, Laimer K, et al. Complications related to midfacial fractures: operative versus non-surgical treatment. *Int J Oral Maxillofac Surg.* 2011;40: 33-7.

6. Sasaki R, Ogiuchi H, Kumasaka A, Ando T, Nakamura k, Ueki T, et al. Analysis of the pattern of maxillofacial fracture by five departments in Tokyo. *Oral Science International* 2008;6: 1.

7. United Nations. World population prospects: the 2008 Revision. Available: http://www.un.org/esa/population/publications/wpp2008/wpp2008_highlights.pdf#search=%27World%20Population%20Prospects:%20The%202008%20Revision.

8. Jin KS, Lee H, Sohn JB, Han YS, Jung DU, Sim HY, Kim HS. Fracture patterns and causes in the craniofacial region: an 8-year review of 2076 patients. Maxillofac Plast Reconstr Surg. 2018 ;40(1):29.

9. Louis M, Agrawal N, Truong TA. Midface Fractures II. Semin Plast Surg. 2017 May;31(2):94-9.