

Analysis of Hematological Parameters of Non-Sickle Men with Priapism in Yola, Nigeria

Emmanuel Asuquo Etim^{1*}, Adjekuko Ohwonigho Collins² and Jacob Nwonoba Nweke³

¹Department of Hematology, Federal Medical Centre Yola, Adamawa State, Nigeria

²Department of Medical Laboratory Services, General Hospital Asaba, Delta State, Nigeria

³Department of Hematology, Faculty of clinical sciences, Ambrose Alli University, Ekpoma, Edo state

ABSTRACT

Background/Objective: Priapism is a penile erectile abnormality characterized by prolonged painful erection, due to disturbances in regulatory mechanism that controls penile engorgement. Despite the role of hematology in diagnosis and management of priapism in Yola, there is dearth of information regarding hematological parameters of men with priapism therefore; this study aims to evaluate some hematological parameters of men with priapism.

Material and Method: 43 subjects participated in this study comprising of 23 men of age 30±2.4years presented with priapism and 20 apparently healthy men without priapism used as control group. Men with priapism in this study presented late with very hard penis and average priapism duration of 5days. Hematological parameters of subjects were determined using Sysmex XN 550 hematological analyzer.

Result: Mean erythrocyte count of subject was 3.61±0.3 X10⁶/μl while red cell count of control group was 4.31±0.3 X10⁶/μl at P<0.05. Mean Cell Volume (MCV) of men with priapism was 89.2±0.8fl while MCV of the control group was 75.3±1.0fl. Furthermore, Mean Cell Hemoglobin (MCH) of control and subject groups were 25.8±0.5pg and 32.1±0.6pg respectively.

Mean total leucocyte count of subjects and control group were 16.8±1.4 X10³/μl and 8.9±1.6 X10³/μl respectively and absolute neutrophil counts of men with priapism was 9.9±2.7 X10³/μl while neutrophil count of control group was 3.5±2.9 X10³/μl.

Conclusion: Men with Priapism had mild leukocytosis as well as increase neutrophil count, MCV and MCH values when compare with control group. It is believed that information provided in this study will improve the clinical care of men with priapism in this locality.

*Corresponding author

Emmanuel Asuquo Etim, Department of Hematology, Federal Medical Centre Yola, Adamawa State, Northeast Nigeria; Tel: +2348063924735; E-Mail: emmasuti@yahoo.com

Received: June 06, 2020; **Accepted:** June 18, 2020; **Published:** June 20, 2020

Keywords: Priapism, Hematological Parameters, Non-Sickle Men

Introduction

Priapism is a penile erectile abnormality that is characterized by prolonged painful erection of the penis. It is a persistent erection that continues hours (≥4hours) after stimulation from either sexual and/or non-sexual stimulus [1]. Priapism is mostly presented as urologic emergency and prompt treatment is usually needed to prevent tissue damage that could lead to permanent inability to get or maintain an erection [2]. Priapism usually results from disturbances and imbalances in regulatory mechanism that controls penile engorgement [3]. First reported in 1845 by Tripe, priapism is now grouped into three categories: ischemic, non-ischemic, and stuttering priapism, depending on its etiology and pathophysiologic pattern [4]. Ischemic priapism, is a veno-occlusive priapism and erection in ischemic priapism is persistent and usually marked by rigidity of the corpora cavernosa with little or no cavernous arterial flow [4]. Tissue ischemia and increased pressure generated within the corporal bodies lead to pain and

rigidity resulting in urologic emergency. On the other hand, Non-ischemic priapism is mostly due to trauma that creates disruption in the cavernous arterial anatomy, resulting in arteriolar-sinusoidal fistula and non-ischemic priapism can also be due to congenital arterial malformations, or iatrogenic insults [5]. Furthermore, in non-ischemic priapism, the corpora are tumescent but not rigid, and patients typically do not complain of pain with erection hence, non-ischemic priapism is not usually an emergency but may still require medical interventions [6]. While Stuttering priapism is an intermittent priapism that is characterized by recurrent episodes of ischemic priapism that can develop into major episodes of ischemic priapism so that both stuttering and ischemic priapism result in the same consequence including ischemic damage to the corporal tissue [7]. Ultimately, Ischemic priapism is the most common priapism variant and accounts for almost 95% of all diagnosed priapism episodes [3].

Priapism has been reported to have greater frequency in people with sickle cell disease when compare to the general population

and Non-sickle men refers to in this study are adult male without sickle cell disease or sickle cell trait [6]. From hematological stand point, Priapism have been reported to be associated with hematological abnormalities including: glucose-6-phosphate dehydrogenase deficiency, thrombophilias, hyperviscosity states, anticoagulants and antihypertensives (α -adrenergic antagonists) medications [8]. Epidemiological studies have linked the risk of priapism to intravascular hemolysis and evaluation of hematological parameters are important in the diagnosis of all categories of priapism globally but, despite the role of hematology in diagnosis and management of priapism, in Yola like most part of Nigeria, there is dearth of information regarding hematological parameters of men with priapism therefore, this study aims to evaluate some hematological parameters of men with priapism in Yola Northeastern Nigeria so as to elucidate the status of hematological changes in this group of patients [1,3,4,5,9].

Materials and Methods

This was a prospective and descriptive study carry out at the hematology department of Federal Medical Center Yola in Adamawa State, Nigeria between March 2016 to January 2018. A total of 43 men participated in the study, comprising 23 men (age 30 ± 2.4 years) with priapism (i.e. subjects) and 20 apparently healthy men without priapism (i.e. Control group). All men with priapism in this study presented late with very hard penis and mean priapism duration of 5 days and were referred to the laboratory for evaluation before commencement of therapy. Other information was retrieved from subject's medical record while the control subjects were recruited from blood donors in the hospital's blood bank. Hematological parameters of all subjects were determined using Sysmex XN 550 hematology analyzer. All analyses were performed according to the standard operational procedures.

Ethical Statement

Ethical approval for this study was obtain from local health research ethics committee of the hospital.

Sample Collection

3ml of blood were drawn from convenient peripheral vein of all participants into K3-EDTA vacutainer tubes. The vacuum tubes were further labeled with subject's number and age. Hematological parameters of subject were determined within 3 hours of blood collection.

Statistical Analysis

Statistical analysis was performed using SPSS computer software version 20.0 (IBM Chicago, IL, USA). Descriptive values were given as mean and standard error of mean. Categorical variables were expressed as the number of cases and the percentage value. The Student's t-test was used to compare the means differences of the estimated parameters and all statistics were carried out at the probability level of 0.05.

Sample Analysis

Using Sysmex XN550 hematology analyzer, the procedure for hematological parameters determination was performed as follows: EDTA samples were placed in a blood mixer for three minutes and the blood cells were automatically counted through a probe fitted in the Sysmex machine. After one minute, the result of the blood cell count was printed out and displayed on the colored LCD screen of the machine.

Results

All subjects presented with ischemic priapism while Stuttering and non-ischemic priapism was not observed in Yola. Analysis

of red cell indices showed that, mean red cell count of subject was $3.61 \pm 0.3 \times 10^6/\mu\text{l}$ while red cell count of control group was $4.31 \pm 0.3 \times 10^6/\mu\text{l}$ at $P < 0.05$. In addition, red cell distribution width-coefficient of variation (RDW-CV) of men with priapism was $11.6 \pm 0.7\%$ while the RDW-CV of control was $13.2 \pm 0.9\%$. Hemoglobin (HGB) level of subject and control was $11.0 \pm 0.6\text{g/dl}$ and $12.3 \pm 1.2\text{g/dl}$ respectively. Furthermore, mean hematocrit (HCT) level of subjects was $32.2 \pm 1.1\%$ while HCT of control group was $39.1 \pm 0.3\%$. On the other hand, Mean Cell Volume (MCV) of men with priapism was $89.2 \pm 0.8\text{fl}$ while that of control group was $75.3 \pm 1.0\text{fl}$. In addition, Mean Cell Hemoglobin (MCH) of control and subject groups were $25.8 \pm 0.5\text{pg}$ and $32.1 \pm 0.6\text{pg}$ respectively. The value of Mean Cell Hemoglobin Concentration (MCHC) of men with priapism was $36.0 \pm 0.2\text{g/dl}$ while MCHC of control group was $33.9 \pm 0.4\text{g/dl}$ at $P < 0.05$ as shown in table 1.

Table 1: Red Cell and Red Cell Indices of subject and control group

S/N	Parameters	Subject's values	Control's values
1	RBC ($\times 10^6/\mu\text{l}$)	3.61 ± 0.3	4.31 ± 0.8
2	Hemoglobin(g/dl)	11.0 ± 0.6	12.3 ± 1.2
3	HCT (%)	32.2 ± 1.1	39.1 ± 0.3
4	MCV(fl)	89.2 ± 0.8	75.3 ± 1.0
5	MCH (pg)	32.1 ± 0.6	25.8 ± 0.5
6	MCHC(g/dl)	36.0 ± 0.2	33.9 ± 0.4
7	RDW-CV(%)	11.6 ± 0.7	13.2 ± 0.9

Examination of Platelet and platelet indices reveals that mean platelet count of subject and control groups were $299 \pm 12 \times 10^3/\mu\text{l}$ and $317 \pm 19.37 \times 10^3/\mu\text{l}$ respectively and Platelet Distribution Width (PDW) of subject group was $9.7 \pm 0.4\text{fl}$ while PDW of control group was $11.5 \pm 1.2\text{fl}$. Moreover, Mean Platelet Volume (MPV) of subject and control group were $10.0 \pm 0.6\text{fl}$ and $9.4 \pm 1.4\text{fl}$ respectively. Men with priapism had Platelet Large Cell Ratio (P-LCR) of $22.7 \pm 1.0\%$ while the control group had P-LCR of $23.4 \pm 2.1\%$ as shown in table 2.

Table 2: Platelet count and Platelet Indices of subject and control group

S/N	Parameters	Subject's values	Control's values
1	Platelet count ($\times 10^3/\mu\text{l}$)	299 ± 12	317 ± 19
2	PDW (fl)	9.7 ± 0.4	11.5 ± 1.2
3	MPV (fl)	10.0 ± 0.6	9.4 ± 1.4
4	P-LCR (%)	22.7 ± 1.0	23.4 ± 2.1

Evaluation of leucocyte count indicates that, mean total white cell count (tWBC) of subjects and control group were $16.8 \pm 1.4 \times 10^3/\mu\text{l}$ and $0.89 \pm 1.6 \times 10^3/\mu\text{l}$ respectively and neutrophil (Neut) counts of men with priapism was $9.9 \pm 2.7 \times 10^3/\mu\text{l}$ while neutrophil count of control was $3.5 \pm 2.9 \times 10^3/\mu\text{l}$. Analysis of lymphocyte (Lymph) count shows that, subject had a mean absolute lymphocyte count of $3.7 \pm 0.9 \times 10^3/\mu\text{l}$ and the control group had a lymphocyte count of $4.1 \pm 2.7 \times 10^3/\mu\text{l}$. Furthermore, monocyte (Mono) count of subject and control group were $1.1 \pm 0.3 \times 10^3/\mu\text{l}$ and $0.6 \pm 0.5 \times 10^3/\mu\text{l}$ respectively. In this study, men with priapism had eosinophil (Eosin) count of $1.9 \pm 0.1 \times 10^3/\mu\text{l}$ while the eosinophil of control group was $0.5 \pm 0.3 \times 10^3/\mu\text{l}$ and basophil (Baso) count of subjects and controls were $0.1 \pm 0.01 \times 10^3/\mu\text{l}$ and $0.6 \pm 0.2 \times 10^3/\mu\text{l}$ respectively as shown in table 3.

Table 3: Total and Differential Leucocyte count of subject and control group

S/N	Parameters	Subject's values	Control's values
1	tWBC (X10 ³ /μl)	16.8±1.4	8.9±1.6
2	Neutrophil (X10 ³ /μl)	9.9±2.7	3.5±2.9
3	Lymphocyte (X10 ³ /μl)	3.7±0.9	4.1±2.7
4	Monocyte (X10 ³ /μl)	1.1± 0.3	0.6±0.5
5	Eosinophil (10 ³ /μl)	1.9± 0.1	0.5±0.3
6	Basophil (X10 ³ /μl)	0.1± 0.01	0.6±0.2

Discussion

Hematological parameters of men with priapism in Yola have been analyzed. Stuttering and non-ischemic priapism was not observed in Yola and all subject presented late with ischemic priapism because they had prolong painful harden penis on arrival and the reason for this late presentation is believed to be due high patronage of folkloric medical treatment in this locality [10]. The red blood cell count, hemoglobin and hematocrit level of subject were slightly lower than that of the control group, this indicates presence of unclassified mild anemia and anemia is a risk factor for ischemia which is a consequence in priapism [11]. On the other hand, analysis of red cell indices indicates that MCV, MCH, and MCHC values of men with priapism were higher than that of the control group. When the MCV is elevated, the RBCs will be larger than normal and are termed macrocytic and MCH is usually elevated in macrocytic anemia associated with vitamin B 12 and folate deficiency while MCHC is elevated in condition associated with decreased RBC survival caused by a structural protein defect in the RBC membrane. Hence, increase values of MCV, MCH and MCHC in this study is a pointer to the presence of macrocytic anemia in men with priapism in Yola.

Table 2 shows that, platelet count and PDW values of subjects were lower than that of the control group. Platelet Distribution Width (PDW), is a measure of variability in platelet sizes and platelet count which indicates the volume of circulating platelets in a unit volume of blood [12]. Hence low PDW value may reflect reduce variability in platelet size among men with priapism in this locality. In addition, MPV and P-LCR values had no significance difference between subject and control groups and the reason for this results is unclear.

Furthermore, the value of total white blood cell and absolute neutrophil count was higher in men with priapism (i.e. subjects) than in men without priapism (i.e. control). This result conforms with the earlier reports by Ergene et al., in Turkey and Minckler et., in USA and there are report that leukocytosis could result in cell sludging in corpora cavernosa resulting in impairment of penile engorgement control mechanism as well as vaso-occlusion which are common episode that produces priapism [12-14]. The value of eosinophil count in subject was higher than that of the control group and the reason for this increase eosinophil result remains unclear.

Conclusion

Ischemic priapism was the predominant type of Priapism observed in this study, Stuttering and non-ischemic priapism was not observed in Yola. Men with Priapism had increased total white blood cell count as well as elevated neutrophil count, MCV and MCH values when compare with control group. It is believed that information provided in this study will improve the clinical care of men with priapism in this locality.

Author's Contribution

Emmanuel Asuquo Etim assisted in sample analysis and Literature Review, while Adjekuko Ohwonigho Collins assisted in Data analysis and Drafting of the literature and Jacob Nwonoba Nweke assisted in Literature review and sample collection.

Acknowledgement

The authors are sincerely grateful to the management of Federal Medical Center Yola, for providing the environment and equipment for this research work.

References

- Berger R, Billups K, Brock G, Broderick GA, Dhabuwala CB (2001) Thought Leader Panel on Evaluation and Treatment of priapism. *Int J Impot Res* 13: 39-43.
- Bennett N, Mulhall J (2008) Sickle cell disease status and outcomes of African-American men presenting with priapism. *J Sex Med* 5:1244-1250.
- Helen R Levey, Robert L Segal, Trinity J Bivalacqua (2014) Management of Priapism: an update for clinicians. *Ther Adv Urol* 6:230-244.
- Montague DK, Jarow J, Broderick GA, Dmochowski RR, Heaton JP, et al. (2003) Members of the Erectile Dysfunction Guideline Update Panel American Urological Association. *J Urol* 170:1318-1324.
- Burnett AL, Sharlip ID (2013) Standard Operating Procedures for Priapism. *J Urol* 10:180-194.
- Broderick GA, Kadioglu A, Bivalacqua TJ, Ghanem H, Nehra A, et al. (2010) Priapism: pathogenesis, epidemiology and management. *Am J Urol* 7:476-500.
- Burnett AL, Bivalacqua TJ (2007) Priapism: Current principle and practice. *Urol Clin North Am* 34:631-642.
- Kropman RF (2014) Hematoma or "partial priapism" in the proximal part of the corpus cavernosum. *J sex Med* 11:2618-2622.
- Gregory James, Kato Gregory, James Kato (2011) Priapism in Sickle-cell Disease: A Hematologist's Perspective. *J Sex Med* 9:70-78.
- Etim EA, Emokpae MA, Ohwonigho AC, Yusuf AA (2018) Association of Platelet Count and Platelet Indices with Stages of Women Breast Cancer in Yola, Nigeria. *Hematol Transfus Int* 6:00145.
- Zeidman A, Fradin Z, Blecher A, Oster HS, Avrahami Y, et al. (2004) Anemia as a risk factor for ischemic heart disease. *Isr Med Assoc J* 6:16-18.
- Leader A, Pereg D, Lishner M (2012) Are platelet volume indices of clinical use? A multidisciplinary review. *Ann Med* 44: 805-16.
- Ergene H, Varim C, Karacaer C, Cekdemir D (2015) Chronic Myeloid Leukemia presented with priapism: Effective Management with prompt leukapheresis. *Niger J Clin Pract* 18:828-830.
- Micheal R Minckler, Ellie Conser, Javier J Figueroa, Aaron J Scott, Joshua Gaither, et al. (2017) The semantics of Priapism and the First Sign of Chronic Myeloid Leukemia. *Case Reports in Emergency Med* 10:1-3.

Copyright: ©2020 Emmanuel Asuquo Etim, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.