

## **Assessment of Complete Blood Count in Gastrointestinal Bleeding Patients Attending A Gastrointestinal Bleeding Center, Khartoum, Sudan: A Preliminary Study**

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**ABSTRACT:** This work was a hospital based study aimed to determine complete blood count (CBC) in adult patients complaining of gastrointestinal (GI) bleeding. The patients selected were adult Sudanese patients with GI bleeding (44 males and 21 females) at age range 16-80 years. Patients were attending Mohammed Salih Idris Center for GI bleeding in Khartoum, Sudan during January to March 2010. Informed consent was obtained from participants (50 patients and 15 controls), then 4 ml of venous blood was withdrawn to investigate CBC components for each participant following a well designed questionnaire. The results of this study showed that, the mean of patient's hemoglobin (Hb) was 8.01 gm/dl, the mean of packed cell volume (PCV) was 24.91%, platelets count was 157.90/mm<sup>3</sup>, mean corpuscular hemoglobin (MCH) was 2.39 pg, mean corpuscular hemoglobin concentration (MCHC) was 31.37g/dl and total of white blood cell (WBC) count was 10,100 cells/mm<sup>3</sup>. These values were statistically different ( $p < 0.05$ ) when compared to that of control. This study concluded that, patients with GI bleeding were at risk of anemia, hypoxia and their medical consequences. Also this study concluded that, GI bleeding has an equal and quite similar impact on patient regardless of gender and age although males were more frequently affected by the disease.

**KEYWORDS;** *CBC, platelets disorders, gastric bleeding*

### **المستخلص:**

هذه الدراسة تمت في مستشفى لتعيين قياسات الدم لمصابين بالنزف المعوي (44 رجل و 21 امرأة) تتراوح اعمارهم من 16 الى 80 سنة تم اختيارهم من المترددين على مركز محمد صالح ادريس للنزف المعوي بالخرطوم فى الفترة بين يناير ومارس 2010. أخذت موافقة المشاركين وتم سحب 4 مل من الدم الوريدي من كل منهم وأجري اختبار قياسات الدم وفقا لاستمارة استبيان معدة لذلك. اوضحت النتائج ان قيم قياسات الدم فى المصابين بالنزف تختلف اختلافا معنويا عن الاصحاء وخلصت الدراسة إلى أن المصابين بالنزف المعوي معرضين لخطر الإصابة بفقر الدم و قلة الأوكسجين و العلل الصحية التي تترتب على ذلك. وإن الإصابة بالنزف لا تعتمد على العمر أو النوع بالرغم من ان اصابة الذكور فى هذه الدراسة كانت اكثر.

## **INTRODUCTION**

Gastrointestinal bleeding in the digestive tract is a symptom of digestive problems rather than a disease in itself. Bleeding can occur as a result of a number of different conditions many of which are not life threatening. Most causes of bleeding are related to conditions that can be cured or controlled, such as hemorrhoids. The causes of bleeding may not be serious but locating the source of bleeding is important. It can originate anywhere from the mouth to the anus and can be overt or occult. The degree of bleeding can range from nearly undetectable to acute, massive and life-threatening bleeding. Initial emphasis is on resuscitation by infusion of intravenous fluids and blood transfusion, treatment with proton pump inhibitors and occasionally with vasopressin analogues and tranexamic acid. Upper endoscopy and colonoscopy are generally considered appropriate to identify the source of bleeding and carry out therapeutic interventions<sup>(1,2)</sup>. Occult bleeding from the gastrointestinal tract is widely believed to be the most common cause of iron-deficiency anemia in patients without an obvious source of blood loss<sup>(3)</sup>. Disturbances in cells blood counts are frequently encountered in patients with Gastrointestinal bleeding probably as a result of gastrointestinal tract diseases. The present study was conducted to obtain clear information about the relation between gastrointestinal bleeding and disturbances of CBC components.

## **MATERIALS and METHODS**

Sixty five adult patients with GI bleeding were chosen randomly from Mohammed Salih Idris Center for GI bleeding in Khartoum. About 4 ml of venous blood was withdrawn from the brachial vein of each participant and poured into 5 ml EDTA container. Immediately after collection of blood, CBC components were determined using the automated machine Sysmex KX21 (Sysmex corporation; Mundelein, Illinois, Sysmex America, Inc) and following the instructions provided by the manufacturer.

## **STATISTICAL ANALYSIS**

Student T test for paired samples which occurs as a component of SPSS version 11.5, was used to calculate means  $\pm$  SD and the means were compared with control.

## **RESULTS**

The gender distribution was 67.7% males and 32.3 % females with an average age of 33years. Fourty five patients had blood in their vomits, 43 have passed black stool, 24 have a history of belharziasis, 5 have hepatomegally and 2 patients have splenomegally. Hemoglobin level, PCV, MCH, MCHC and platelets count of patients were statistically decreased from that of corresponding values of control, while total number of white blood cell (WBC) was statistically higher when compared to control (Table 1). Effects of GI bleeding on CBC of both sexes was found to be equal and no significant statistical difference has been noticed (Table 2).

*Table 1: CBC components in patients with GI and control*

CBC components	Participants	No.	Means	P values
Hb (gm/dl)	Patients	50	8.0128	0.00
	Control	15	14.5227	
RBC (/mm <sup>3</sup> )	Patients	50	3.6674	0.42
	Control	15	4.6667	
PCV (%)	Patients	50	24.8100	0.00
	Control	15	40.1400	
MCV (femtoliter)	Patients	50	81.4560	0.24
	Control	15	85.4267	
MCH (pg/cell)	Patients	50	26.3960	0.00
	Control	15	31.0867	
MCHC (gm/dl)	Patients	50	31.3738	0.00
	Control	15	36.4067	
WBC (mm <sup>3</sup> )	Patients	50	10.1080	0.00
	Control	15	6.3333	
Platelets (mm <sup>3</sup> )	Patients	50	157.9800	0.00
	Control	15	305.6000	0.00

*Table 2: CBC components in male and female patients with GI bleeding*

CBC components	Male	Female	P value
Hb	08.91	10.80	>0.05
PCV	26.85	31.48	>0.05
RBC	04.00	03.68	>0.05
MCV	83.41	80.20	>0.05
MCH	27.12	28.23	>0.05
MCHC	37.15	33.35	>0.05
WBC	10.24	7.13	>0.05

## DISCUSSION

Bleeding depletes the energetic sources of the body and leads to death. It is widely accepted in medical practice that patients coming with bleeding should have their bleeding stopped and their blood status to be assessed as a first line of treatment before commencing any medication<sup>(4)</sup>. One of the invaluable means for assessment of blood status is the CBC test which is important for patients coming with occult blood loss<sup>(5)</sup>. The CBC test may be performed under many different conditions and to assess many different symptoms or diseases<sup>(6)</sup>. Hemoglobin, MCV, MCH, and MCHC values reflect the size and hemoglobin concentration of individual cells, and are useful in diagnosing different types of anemia<sup>(6,7)</sup>. In the present study

CBC components, except total number of WBC, decreased compared to that of control.

The results of this study reflect problems with fluid volume (such as dehydration) or loss of blood, reveal problems with RBC production and destruction, or help diagnose infection and allergies associated with GI bleeding. Depending on the present results, it is obvious that, patients with GI bleeding in this study were affected with serious complications of decreased CBC values. Among these complications are lower RBC function, low O<sub>2</sub> supply to various tissues and anemia. These complications mainly occurred due to deficiency in RBCs which transport hemoglobin which, in turn, carries oxygen. The amount of oxygen received by the

body tissues depends on the amount and function of RBCs and hemoglobin<sup>(6-8)</sup>.

The type of anemia which associated with occult blood, in the patients of this study has been found to be iron deficiency anemia<sup>(9-11)</sup> and characterized by microcytic hypochromic features (MCV and MCH were less than lower limits of normal). Thrombocytopenia is also likely possible to occur among the participants of this study, platelets count was statistically lower than that of control. Thrombocytopenia, anemia, and neutropenia are usually defined as two standard deviations below values observed in the normal population<sup>(12,13)</sup>. The results also indicated that GI bleeding may lead to serious microbial infections unless control measures were taken into consideration.

The results obtained in this study were comparable and agreed with many results reported (Hb and PCV values reported were 6.4g/ml and 28%, respectively) when some of CBC components were investigated in GI bleeding cases<sup>(7,9,12,14)</sup>. One of the observations noticed in this study was that, both men and women were affected equally by GI bleeding.

## CONCLUSIONS

The present study concluded that, patients with GI bleeding were at risk of anemia, hypoxia and their medical consequences. Also it can be concluded that GI bleeding has an equal and quite similar impacts on patients regardless of their gender and age although males were more frequently affected by the disease.

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