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Research Article

Effect of fever on some haematological parameters in owerri metropolis

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Abstract

Fever is an increase in body temperature usually caused by bacterial,viral or parasitic infection which has adverse effect on some haematological indices such as packed cell volume,total white blood cell, haemoglobin and differential white blood cell were assessed amongst subjects suffering from different degrees of feveric conditions. A total of 100 subjects were studied comprising of 50 test subjects and 50 control subjects who were apparently healthy with normal body temperature. Each of the samples were analysed using standard haematological procedures. Results obtained showed statistically decrease ($p<0.05$) in packed cell volume,total white blood cells,haemoglobin,lymphocyte and neutrophil.No statistical difference ($p>0.05$) was observed in monocyte,eosinophil and basophil.The result obtained from this work could be applied in the management of most feveric condition.

Keywords: Fever, ,viral or parasitic infection, statistical difference.

Introduction

Fever is a rise in body temperature above normal,especially above an oral temperature (37^0C) or a rectal temperature (37.2^0C)(Oxford Concise Medical Dictionary,2002).Fever is generally accompanied by shivering,haedache,nausea,constipation,or diarrhoea.A rise in temperature above 40-50^0C may cause delirium and in young children,convulsion.Fever is usually casued by bacterial,viral or parasitic infections and can accompany any infectious illness,from the common cold to malaria.An intermittent fever is a periodic rise and fall in body temperature,often returning to normal by the day and reaching its peak at night,as in malaria.A remittent fever is one in which body temperature flutuates but does not return to normal. A relapsing fever is an infectious disease caused by bacterial of genus Borrelia,which is transmitted by ticks or mice.Circulating proinflammation cytokines play a pivotal role in transmitting the signal responsible for inducing a febrile responsible for the peripheral tissues to the CNS.However,additional mechanisms may have an important role in the pathogenesis of fever,including local production of cytokines,direct induction of fever by exogenous pyrogen and membrane bound cytokines .

Packed cell volume is a measured quantity of blood to which an anticoagualant has been added and the cells being centrifuged at 2000rpm,also called haematocrit reading (Mosby's Medical Dictionary,2009).Packed cell volume is a percentage of the total volume of whole blood occupied by packed red cells,when a known volume of whole blood is centrifuged at a

constant speed or a constant period of time(Ochei,2008).White blood cells are heterogenous group of nucleated cells that can be found in circulation for at least a period of their life.They play a most important role in phagocytosis and immunity and therefore in defense against infection (Cline et al.,2003).

Haemoglobin is a chromoprotein consisting of a globin molecule attached to four red coloured haem molecules.These globin molecules consist of two alpha and two beta polypetide chains.Haemoglobin is formed in the developing erythriocyte in the bone marrow(Ochei,2008).

Blood film is a thin layer of blood smear on a way to allow the various blood cells to be examined microscopically.Blood films are usually examined to investigate haematological problems and occasionallly,to look for parasites within the blood such as malaria and filaria(Warhurt and Williams,1996).

Aim and objective

i.To determine the effect of fever on PCV,WBC,Hb and differntial count when compared tonormal subject.
ii.To determine the haematological parameter mostly affected.

Materials and Methods

Study Area: This study was conducted in Owerri Metropolis.

Study Population and Recruitment

The population of the study was drawn from some private laboratory and some Imo State University,Owerri students.100 samples in total,50 male and 50 females were collected.Different degrees of fever were determined in patients of which 25 males and 25 females has high degree of fever and 25 males and 25 females who had normal degrees of fever these were used as control.

Sample:3ml of venous blood was collected from each suject with a sterile syringe and dispensed into EDTA anticougulated container.The required tests were carried out immediately in the laboratory.

Haematological parameters carried out

A.Packed cell volume: Microhaematocrit method of Dacie and Lewis (2007) was used.

b.Total white blood cell: Neubauer Counting Chamber of Cheesbrough (2008) was used.

c.Haemoglobin estimation: Cynmeth (HiCN) of Cheesbrough (2008) was used.

Differential white blood cell count: Leishman stain Technique of Cheesbrough (2008) was used.

Statistical analysis: The results were analysed using t-test and statistical significance set at $P < 0.05$.

Results

Table 1:mean values of some haematological parameters of the entire subjects

Parameters	Test(50)	Control(50)	Level of Significance
Temp(^{0}C)	37.45±0.37	36.29±0.45	
PCV(%)	31.17±2.67	39.14±2.39	P<0.05
TWBC(X10^9/L)	3.56±0.89	5.17±0.22	P<0.05
Hb(g/dl)	10.39±0.92	13.0±0.83	P<0.05
Neutrophil(X10^9/L)	1.58±0.43	2.60±0.24	P>0.05
Lymphocyte(X10^9/L)	1.98±0.68	2.59±0.43	P>0.05

Table 2:mean values of some haematological parameters of the male subjects

Parameters	Male Test(25)	Male Control(25)	Level of Significance
Temp(^{0}C)	37.45±0.37	36.29±0.45	
PCV(%)	39.0±0.52	49.2±3.15	P<0.05
TWBC(X10^9/L)	3.45±0.65	4.19±0.12	P>0.05
Hb(g/dl)	11.0±0.71	13.28±0.63	P<0.05
Neutrophil(X10^9/L)	1.49±0.24	2.42±0.39	P>0.05
Lymphocyte(X10^9/L)	1.82±0.65	2.38±0.22	P>0.05

Table 3 :mean values of some haematological parameters of the female subjects

Parameters	Female Test(25)	Female Control(25)	Level of Significance
Temp(^{0}C)	37.3±0.36	34.15±0.42	
PCV(%)	30.0±2.41	39.1±0.48	P<0.05
TWBC(X10^9/L)	3.0±0.52	3.2±0.58	P>0.05
Hb(g/dl)	9.0±0.68	10.0±0.52	P>0.05
Neutrophil(X10^9/L)	1.22±0.44	2.14±0.47	P>0.05
Lymphocyte(X10^9/L)	1.34±0.48	2.24±0.24	P>0.05

Discussion

Table 1 showed significant difference ($p<0.05$) in PCV,TWBC and Hb and other showed no significant difference ($p>0.05$).Table 2 showed significant difference ($p<0.05$) in PCV and Hb,while tabel 3 showed significant difference ($p<0.05$) only in PCV.

In this study,the haematological parameters of PCV,TWBC,Hb,Differential Count were investigated on subjecst with fever to determine the extent the bacterial,viral or parasitic infections affects the parameters.The study is in conformity with the work of Aprihyan (2000).When this investigations were carreied out, 103 fever patients by Taha et al.(2007),it was observed that their PCV,TWBC,Hb,Neutrophil and Lymphocytes were decreased meaning that in the case of bacterial,viral or parasitic infection,the spleen and bone marrow function were disturbed by the bacterial and viral attack which probably made the spleen and bone marrow not to produce blood cells necessary for attacking the infections.

The study showed that the parameters mostly affected in patients with fever were PCV,TWBC and Haemoglobin which is in agreement with the findings of Marx (2006).The likely things that can cause reduction in the parameters are bacterial,viral or parasitic infections (Listernic,2012).

Conclusion

In fever patients,this study showed that bacterial,viral or parasitic infection affects the PCV,TWBC and Haemaoglobin by affecting the temperature of the patient.This can happen by the level of cytokine synthesis and release which could upregulate or downregulate the haematopoiesis.Fever should be among the first clinical conditions controlled when an individual is sick becuase it can cause disruption to most of the haematological parameters.

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