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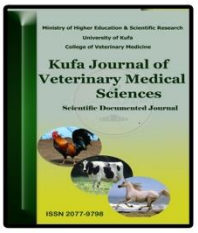

Cow, Sheep And Goat Hematological Parameters: Comparative Studies Between Automated Analyzer and Manual Methods

Ibraheem E.Ibrhim

Department of Public Health, College of Veterinary Medicine, University of Kufa.

Kufa, Iraq

ibraheeme.ibraheem@uokufa.edu.iq

Abstract

This study was designed to compare the values of some hematological parameters in some farm animals estimated by Automated Analyzer and Manual method estimation. The blood samples were collected randomly from five animals from each of the following species; cow, sheep and goat (5 sample for each). The blood samples were divided into two parts, the first were used for manual estimation and the second was analyzed by automated hematology analyzer.. The blood profile showed no significant variation ($p; < 0.05$) in White Blood Cells (WBC), Red Blood cells (RBC) between all animals groups. The results of this study showed significant differences that revealed decreased in the Hemoglobin (HB) (20 g/dl) and (20.5g/dl) in cow and sheep respectively and increased of Package Cell Volume(PCV) (33.33%) . However, goat revealed significant increase in Package Cell Volume and Hemoglobin (6.04%and 21g/dl).

Key words: - automated hematology analyzer, cow, sheep, goat.

المعايير الدموية للابقار و الاغنام و الماعز : دراسة مقارنة بين الطريقة الاوتوماتيكية و الطريقة اليدوية

ابراهيم عريان ابراهيم

فرع الصحة العامة / كلية الطب البيطري / جامعة الكوفة

الكوفة/ العراق

ibraheeme.ibraheem@uokufa.edu.iq

الخلاصة

صممت هذه الدراسة لتحديد الدقة بين القياسات الدموية باستخدام الجهاز الاوتوماتيكي لقياس المعايير الدموية و الطرق اليدوية التقليدية في حيوانات المزرعة الابقار , الاغنام و الماعز , حيث اظهرت النتائج عند مستوى معنوية $p, < 0.05$ عدم وجود اي اختلاف معنوي في عدد خلايا الدم البيضاء و كريات الدم الحمراء , و اظهرت الدراسة وجود انخفاض معنوي في تركيز خضاب الدم بالطريقة اليدوية (20 غم/100مل) في الابقار و ظهور ارتفاع معنوي في حجم الكريات المرصوصة

بالطريقة اليدوية (33.33%) وانخفاض معنوي في تركيز خضاب الدم (20.5 غم /100مل) في الاغنام , و ارتفاع معنوية في حجم الكريات المرصوصة و تركيز خضاب الدم بالطريقة اليدوية (6.04% و 21 غم/100مل) في الماعز.
الكلمات المفتاحية:- الجهاز الاوتوماتيكي لقياس المعاير الدموية , ابقار , اغنام , ماعز

Introduction

The conventional manual method for hematological investigation and micarospia leukocyte of result counts has replaced by the automized hematology analyzer with complete blood count (CBC) result in most institution. [1]. The disadvantage of ordinary manual method includes wasting time; need preview preparation, expert personal, and marking error[2]. and replaced by modern automated hematology analyzer [3]. which more accurate results within shot period of time movement the automated method have been showed a simple reduction and in the member of medical technologists and technicians in clinical laboratory, although, the automated hematology analyzer provide fast and accurate results in all presumptive conditions, false results related either to platelets or other parameters from complete blood count may be observed in several instances. False low white blood cells (WBC) count may be seen due to agglutination in the presence of (EDTA) Therefore, the manual method of for primary calibration and quality control may be still advised [3,4].

The good for my present study is conducted to elucidate reliability of automated hematology analyzer counts in comparison to manual methods

Materials and Methods

A- Blood sample: - fifteen peripheral venous blood samples were randomly withdrawal from animal including five samples from cow, sheep, and gout aseptically. The entire animals were grassing in the farm of Faculty of veterinary medicine /university of Kufa, the blood sample was collected aseptically from each animal into tri-potassium ethylenediamine tetra-acetic acid (K3EDTA) anticoagulant tube (AFCO, Jordan). Then the blood sample was well mixed by gentle inversion for complete blood count analysis. Blood sample was divided into 2 parts

B- Manual method :-tow milliliters (2ml) of blood sample with anticoagulant were analyzed with standard hematological method with hematocytometer and microscope according hemogbin (Hb) by sahli's method

C- automated method :- Two milliliters for manual method and one milliliter for automated method using hematology auto analyzer Genex Count C60 (Genx lab.,USA).

Statistics

The data were subjected to statistical analysis of variance followed by the least significance difference test .Student's *t*- test

was used for the means of two groups [5]. The level of significance was at $p<0.05$, by using computerized program spss 13.

Results

The results of this study revealed a significant decrease in bovine Hb concentration (20 gm/dl) that measured by the manual method in compare with the automated analysis (Table 1).

Table (1) shows the hematologic profile of bovine blood.

Test	*WBC* 10^3*/ml*	*RBC* 10^6*/ml*	*PCV %*	*HB g/dl*
Automated	15.67 ±1.6	5.93± 0.18	28.95± 0.93	20.5±0 .64
Manual	15.25 ±1	5.79± 0.28	33.00± 1.4	20.0±0 .91*

*Significant difference between automated and manual methods $p < 0.05$

The results also showed differences between the hematological values estimated by automated analysis in compare to manual estimation in sheep. The results revealed a significant increase in PCV concentration (33.33±3.5%) and significant decrease in HB concentration (20.5 gm/dl) (Table 2).

Table (2) shows the hematologic profile of sheep blood.

Test	*WBC* 10^3*/ml*	*RBC* 10^6*/ml*	*PCV %*	*HB g/dl*
Automated	28.27± 5.56	10.61 ±8.8	25.50± 3.9	22.75± 1.7
Manual	21.01± .65	19.65 ±1	33.33± 3.5*	20.50± 2.3*

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In goat, the blood samples assay using manual methods revealed a significant increase in PCV concentration (6.04%) and HB concentration (21 gm/dl) in compare to automated analysis (Table 3).

Table (3) shows the hematologic profile of caprine blood.

Test	*WBC* 10^3*/ml*	*RBC* 10^6*/ml*	*PCV %*	*HB g/dl*
Automated	15.52 ±5.2	5.50±0 .92	36.77 ±3.3	19.00± 1.8
Manual	16.90 ±2.1	6.04±0 .76*	38.25 ±8.9	21.00± 1.8*

*Significant different between automated and manual methods $p < 0.05$

Discussion

Automated laboratory hematology analyzers are mentioned to perform leukocyte differential counts and erythrocyte morphologic evaluation with more precision and accuracy those available by manual method [1]. Estimation of PCV by the manual method may result in variations in the RBC indices. More over Hb conc. By the manual method showed significant difference in comparison with automated method which may lead in misclassification of values for diagnosis of the anemia. This indicated that, the automated method still has some advantages over the manual methods, although it is slow and at times consuming [4]. many investigations approved that the acid fast hematite method (Sahli's method) gives different values of hemoglobin percentage for the same subject, when measured by automated analyzer and using non-cyanide hemoglobin analysis method [6]. The regression analysis of estimates hemoglobin level indicates that there is significant correlation in relation to

line of identity. This means that automated analyzer is an accurate device and can be used to measure hemoglobin level in blood [7, 8]. The result of the present study is in contrast with the earlier previous studies [2, 3], who reported that automated hematology instruments are more accurate in the detection of specimens with distributional or morphologic abnormalities than by the traditional eye count method. However, the 100 cell count adopted in this present study could have contributed to some statistical variations observed between the automated and manual methods. [9, 10].

Conclusion

Automated analyzer Genex Counter 60 is easily handling to perform; it is reproducible and accurate device for the measurement of blood profile in cow, sheep, and goat.

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