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EFFECT OF EDTA AND TRISODIUM CITRATE ON BLOOD CELL COUNT AND MORPHOLOGY– A COMPARITIVE STUDY

Health Science

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ABSTRACT

EDTA and Trisodium citrate are most commonly used anticoagulant in hematology laboratory .storage of thsese anticoagulated blood samples over a period of two hours can change RBC morphology ,nuclear Cytoplasmic pattern of WBC and also change in platelet aggregation property. So it is very necessary to process the sample immediately after the collection of sample inorder to reduce errors in report

KEYWORDS

EDTA,Trisodium citrate, storage, cell morphology

INTRODUCTION

Anticoagulant is a substance that can prevent blood coagulation. It has been used for various purposes for past 70 years for treatment of emboli and blood clots, laboratory test, blood bags, and in various equipments. EDTA, trisodium citrate, oxalates, and heparin are commonly employed for the purpose.

Samuel reported in his study that prolonged storage of EDTA anticoagulated blood will increases rate of haemolysis and also there will be morphological change .

Walencik J found in his study that both Na_2EDTA and citrate can cause poikilocytosis, anisonucleosis and increased sensitivity for hemolysis.

McShine RL outlined that there will be a fall in platelet count on storage with EDTA and citrate, fall is high in citrate than EDTA.

Shaista Choudhary reported that ther will be storage artefacts like nuclear lobulation, vacoulation of WBC, crenation and damage to RBC also platelet aggregation with EDTA on storage .

The study was conducted to find out the possible pre analytical errors when there is delay in sample processing.The study help to lay out the importance of doing test without delay.

Different Forms of Edta And Trisodium Citrate In Use
Table – 1

Anticoagulant	substance	Concentration in use with blood
EDTA	Disodium EDTA	1.5mg/ml
	Dipotassium EDTA	1.5mg/ml
	Tripotassium EDTA	1.5mg/ml
TRISODIUM CITRATE	3.2% TRISODIUM CITRATE	1 volume to 9 volume of blood
	3.8% TRISODIUM CITRATE	1 volume to 4 volume of blood

MATERIALS AND METHODS

The study was carried in 40 samples of patients from both sexes belonged to age group of 30-40years.Blood samples were taken into two anticoagulants viz EDTA and 3.8% trisodium citrate .a direct smear without anticoagulant was also made which serve as control. peripheral smears were prepared from the sample immediately(0 hour),at 2 hour ,4 hour and at 6 hours after collection.

Smears were stained with leishman's stain and observed under microscope and observed for RBC morphology, nuclear cytoplasmic change in WBC ,and for platelet morphology and aggregation .

Table-2

TIME (HOURS)	parameter	0	2	4	6
EDTA	poikulocytosis	0%	0%	37.5%	100%
Trisodium citrate		100%	100%	100%	100%
EDTA	Nuclear rupture of WBC	0%	13%	62.5%	100%
Trisodium citrate		0%	85%	100%	100%
EDTA	Nuclear vacoules	0%	25%	90 %	100%
Trisodium citrate		0%	30%	100%	100%
EDTA	Cytoplasmic rupture	0%	45%	100%	100%
Trisodium citrate		0%	85%	100%	100%
EDTA	Cytoplasmic vacoules	0%	80%	100%	100%
Trisodium citrate		0%	95%	100%	100%
EDTA	Platelet aggregation	0%	5%	90%	100%
Trisodium citrate		0%	100%	100%	100%
EDTA	Platelet swelling	0%	5%	85%	100%
Trisodium citrate		0%	90%	100%	100%

CONCLUSION:

This study was carried out to find out formation of artefacts with EDTA and trisodium citrate anticoagulant .By this study it is able to conclude that artefacts formation is dependent on anticoagulant and time.Upon storage with trisodium citrate artefacts can form immediately as compared to EDTA .Although storage with both anticoagulant are for same time and under same conditions ,artefacts formation is more with trisodium citrate .

Storage upto 6 hours can cause changes in RBC morphology from disc to sphere. Leucocytes morphology and platelets also affected .There is a nuclear and Cytoplasmic changes in leucocytes which seen with both anticoagulants, but observed faster in citrate than EDTA.There is platelet aggregation is more with trisodium citrate ,but platelet swelling is observed first with trisodium citrate .Counts were found to be unaffected with little effect on platelet .

So EDTA is the best anticoagulant for preparation of peripheral blood smear and also, smear should be made immediately after collection of blood.A delay of more than 2 hour can affect result erroneously.

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