PROTHROMBIN TIME AND ACTIVATED PARTIAL THROMBIN TIME VALUES AMONG GERIATRIC IN NATIONAL HOSPITAL ABUJA NIGERIA

BY

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INTRODUCTION

The prothrombin time (PT), activated partial thromboplastin time (APTT) and bleeding time (BT) are screening test for haemostasis. Typical indications for ordering these test include hemorrhagic symptoms, monitoring of anticoagulant therapy, and routine pre operative screening(Mann et al,1999). When platelets and clotting factors circulate in an inactive form,blood flows freely through the vascular system.

CONTD

However, vascular injury and the resulting disruption of the endothelium lead to the initiation of a complex haemostatic response broadly classified into primary and secondary haemostatic response (Davie et al,1991), bleeding symptoms in the patients or in a member of the patients family can often prompt laboratory evaluation to test for bleeding disorder .

CONTD

Spontaneous bleeding (epistaxis, ease of bruising, joint bleeding) or unusual or unexpected bleeding after surgery. The PT, APTT and BT are screening test for heamostasis. The bleeding time test has lost favour in recent years, but the PT and APTT remain the most frequently ordered tests in coagulation medicine. To properly managed patient, physicians must determine whether the prolonged PT, APTT and BT are artificial, medication related to representative of haemostatic abnormalities.(Arkin et al,2003).

CONTD

Hemostasis is a complex interaction between the **vessels, platelets, coagulation factors, coagulation inhibitors** and **fibrinolytic proteins** to maintain blood within the vascular component in a fluid form.

Blood within the vascular tree remains fluid throughout life, but if a blood vessel is damaged, blood will clot in a rapid localized response. Failure of clotting leads to bleeding disorders.

The haemostatic system is complex, and many congenital and acquired conditions can disturb its correct functioning.

COMPONENTS OF HAEMOSTATIC NETWORK

- Vessel wall
- Platelets
- Coagulation pathways

MATERIALS AND METHODOLOGY

This comprises of 40 patients undergoing surgery given anaesthesia were studied at National Hospital Abuja Nigeria. The patients were analysed for PT, APTT according to Lewis and Decie 2001. The samples were obtained before commencement of anaesthesia, 1hr post, 24hrs post, 48hrs and 72hrs post surgery/anaesthesia respectively for 5days

Sample collection

Whole blood was drawn with minimum stasis into 4.5ml citrate bottle via the antecubital vein using vacutainer syringe and needle. Each sample was then mixed gently thoroughly to ensure anticoagulation and prevent cell lysis and was centrifuged and the plasma separated into cyovials.

PROTHROMBIN TIME

PRINCIPLE;

Tissue thromboplastin in the presence of calcium activate the extrinsic pathway of the coagulation system.

PROCEDURE;

- water bath was set and regulate at 37 degree celcus.
- 100ul of plasma was added into their respective tubes and allow to stand for 3-5 minutes.
- 200ul of SP NORMOPLASTIN was also added into each of the respective tubes and simultaneously start a stop watch.
- The tube was then gently tilt and stop the watch as soon as the first fibrin strand is visible and record the time in seconds.
- Repeat the test for 2-3 duplicates and take average.

PARTIAL THROMBOPLASTIN TIME AND KAOLINE

PRINCIPLE;

cephaloplastin activate the coagulation factors of the intrinsic pathway in the presence of calcium ion.

PROCEDURE;

- water bath was set and regulate at 37 degree celcus.
- 100ul of plasma was dispense into their respective tubes and allow to stand for 3-5 minutes.
- 100ul of SP UNICELIN reagent was added into each of the respective tubes and allow two stand for two minutes.
- 100ul of calcium chloride was added into each of the respective tubes and simultaneously start a stop watch.
- The tubes was then gently tilt and stop the watch as soon as the first fibrin strand is visible and record the time in seconds.
- The test was repeated for 2-3 duplicates and take average.

Statistical Analysis of Data

The data generated were processed and analysed using a statistical software and summerised as Mean±SD,SEM, and compared using Mann Whitney U test for non- normally distributed data. The level of significance in the differences between the mean was inferred at $P<0.05$.

Result

The mean±SD,SEM, of activated prothrombin time test in al patients show a sharp increase after 1hr $p>0.05$ of surgery but lowers gradually in 24hr and also the mean,SD,SEM, of prothrombin time in all patients rises drastically after 1hr $p<0.05$ and start decreasing on the 3rd day 24hrs $P<0.001$ tending toward normal.

TABLE 1.Showing Mean±SD,SEM of all Study Subjects

Parameters	pre	1hr	24hr	48hr	72hr
PT(sec)	17.3±0.92	19.0±0.95	17.8±1.09	17.2±0.79	19.1±1.63
APTT(sec)	38.5±1.82	42.6±1.75	41.4±2.04	40.2±1.80	38.7±1.70

TABLE 2.Sex Disstributed of Mean±SD,SEM of PT,APTT Among the Study subjects

Parametes	pre	1hr	24hr	48hr	72hr
PT(sec)	17.0±0.97	19.3±1.05	17.1±0.99	17.1±0.99	17.7±0.91
}male					
APT(Tsec)	39.7±2.1	44.9±1.18	41.1±1.85	41.1±1.89	40.5±1.72
PT(sec)	15.9±0.69	17.3±1.059	16.4±0.76	15.9±0.67	15.6±0.47
}female					
APTT(sec)	40.9±2.92	44.8±2.90	44.7±1.84	41.7±1.81	39.8±1.78

TABLE 3.Statistical comparisons of all parameters with the pre-values

Parameters	pre	1hr	24hr	48hr	72hr
PTsec	16.4±0.59	18.3±0.63	16.75±0.61	16.5±0.59	16.65±0.55
APTTsec	40.3±1.76	44.8±1.76	42.9±1.33	41.4±1.27	40.15±0.08

P=>0.05 significant

DISCUSSION.

Prothrombin time and activated thrombin time are among the most common orderd coagulation test, which measures extrinsic and intrinsic pathway of coagulation. As the fundamental assays of coagulation system, the principal clinical uses of these test include detection of coagulation inhibitors monitoring heparin anticoagulant therapy and coagulation factor relplacement therapy.

COND

Our study shows that there were no significant difference at P>0.05 in the values of PT & APTT ,majority of the participant subjects show a considerable normal PT and APTT, though in some of the patient the haemostatic function could be assume to be normal during surgery, but a noticeable experimentally prolonged prothrombin time though not significant at 1hr post anaesthesia which culminate in a depleted FVII activity observed should be regarded as a potential hazard and should be regarded as critical period to avoid a possible bleeding episode, though this could be a function of haemorrhage.

CONTD

The results show a sharp increase in prothrombin and activated prothrombin time which could be an indication of hereditary or acquired intrinsic factors deficiencies. Also the sex distribution of all study subjects show that among the male there was an increase at one hour compared to the pre-values analysis in both prothrombin time and activated partial thrombin time which is in agreement with Hassel et al 1989

CONTD

But in began to go back to normal at 24hr,48hrs and 72hrs respectively, while the female counterpart show similar result which shows a sharp increase at 1hr and began to decrease steadily at 24hr,48hr and 72hr to the pre value, even though the male show a significant increase than the female counterpart, which may raise concern of a bleeding disorder, severe deficiencies of factor XII, however result in bleeding disorder of varying severity depending on the levels of individuals factors.

CONTD

Male and female patients also recorded the same trends as in other cases considered. Therefore, there may be no sex variation in the haemostatic variables, we therefore recommends that this group of patients should be studied for a long duration to ascertain completely the haemostatic system.

CONCLUSION

Haemeostasis is a very delicate system consisting of numerous network working connectively which a defect in one or more of the networking component completely compromise the whole system.

RECOMMENDATION

It is recommend that Further research be carryout for specific factor assays for a particular clotting factor as test such as Bleeding Time, Prothrombin Time and partial Thromboplastin Time and Kaolin only demonstrate a collective activity of the clotting factors that are either in the intrinsic or the extinsic pathways.

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