



COAGULATION PROFILES IN NORMAL FULL-TERM NEONATE IN THE FIRST WEEK OF LIFE IN LAGOS-NIGERIA

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Coagulation profiles

Condition	PLT	INR	APTT	Fibrinogen	D-dimer
Advanced liver disease	↓	↑	Normal or ↑	↓	Normal or ↑
vWD	Normal or ↓	Normal	Normal or ↑	Normal	Normal
DIC	↓	Normal or ↑	Normal or ↑	Normal or ↓	↑
Hemophilia	Normal	Normal	↑	Normal	Normal
Antiphospholipid syndrome (APS)	Normal	Normal	↑	Normal	Normal
Pregnancy	Normal	Normal	Normal	↑	↑

ABSTRACT

Typical reference estimations of haemostatic profiles are much of the time expected to aid finding and the executives of draining issue. Due to the anatomical and physiological contrasts among neonates and grown-ups, it is fundamental to realize the reference scope of coagulation profiles in neonates in the principal seven day stretch of life. The point of this examination is to set up a typical reference go for coagulation profiles in ordinary full-term neonates in the primary seven day stretch of life in Lagos-Nigeria..

Methods

This is a cross-sectional investigation completed among ordinary full-term neonates conceived in Lagos Island Maternity Hospital and Lagos University Teaching Hospital. Neonates' statistic information were recorded. Citrated plasma was gathered and tried for Prothrombin Time (PT), Partial Thromboplastin Time with Kaolin (PTTK) and Thrombin Time (TT) utilizing Coatron M2 Coagulation Analyzer (TECO GmbH in Germany). Reference esteems were built up for neonates in the first seven day stretch of life by utilizing the recipe of Mean ± 2 Standard Deviation (SD) that is at 95% certainty level. Relative investigation was done between the mean estimations of neonates and grown-ups built up mean qualities.

Results

The Mean ± Standard Deviation of PT, PTTK and TT at the principal seven day stretch of life were 13.41 ± 1.33 seconds, 43.38 ± 6.75 seconds and 24.01 ± 3.03 seconds individually. Utilizing the recipe of Mean ± 2SD, the reference scopes of PT, PTTK and TT were 10.7-16.07seconds, 29.88-56.88 seconds and 17.95-30.07 seconds separately. Factually critical contrast was seen when mean estimations of PT, PTTK and TT of neonates at the first seven day stretch of life were contrasted and grown-ups built up qualities done in the nation and somewhere else on the planet (p-esteem < 0.05).

Keywords: Reference esteems, full-term neonates, prothrombin time, halfway thromboplastin time with kaolin , thrombin time.

INTRODUCTION

Typical homeostasis is the way toward shaping clumps in the dividers of harmed veins and counteracting blood misfortune while keeping up blood in a liquid state inside the vascular system.1 in case of tissue or veins harm, three components work locally to control the dying; vessel constriction, development of platelet fitting and arrangement of fibrin. Ordinary haemostatic instrument comprises of

four segments; Blood vessel divider, Platelets, Coagulation and procoagulants factors and the Fibrinolytic system.²

The improvement of haemostasis in the infant varies from that of grown-up and coagulation factors don't cross the placenta obstruction. They are orchestrated autonomously in the embryo. The combination of these coagulation factors are reliant on two factors: the gestational age and the dimension of development of the liver. ³

During childbirth the dimension of the contact factors (XII, XI, high sub-atomic weight kininogen) and Vitamin K subordinate variables are diminished to about half of grown-up values.^{4,5} Thrombin age is additionally decreased by 30-half of grown-up levels.⁶ This suggests screening test like Prothrombin Time (PT), Partial Thromboplastin Time with Kaolin (PTTK) and Thrombin Time (TT) might be longer in neonates. In any case, the way that the neonates don't drain is suggestive of a conceivable compensatory balance. For example the fibrinolytic framework is additionally down controlled with a reduction in the dimensions of plasminogen to half of grown-up level and an expansion in plasminogen activator inhibitors.⁷

The most helpful screening tests in neonates are: the prothrombin time, halfway thromboplastin time with kaolin, thrombin time, fibrinogen examine and platelet check, anyway age explicit reference ranges are required for suitable interpretation^{8,9}

In Nigeria, little data is accessible about coagulation profiles in neonates. Grown-up typical reference esteems are accessible in many healing centers yet those of neonate are rare. The point of this examination was thusly to decide the reference estimation of coagulation profile in clearly sound neonates in the principal seven day stretch of life and contrast and set up grown-up esteems in the nation and different parts of the world.

MATERIALS AND METHODS

STUDY POPULATION

Two hundred typical full-term neonates (200) conceived in Lagos Island Maternity Hospital and Lagos University Teaching Hospital were selected into an investigation for a time of seven months; August, 2013 through February, 2014. The neonates were haphazardly chosen upon acknowledgment by their folks, however there were guardians who declined to take an interest in this examination, we didn't really recorded number of guardians who denied since some of them didn't clarify the explanations behind their refusal while some communicated sensitivity to their neonates. Statistic information were taken in conveyance enlist and by meetings with the guardians. The information were reported in the information accumulation sheet.

INCLUSION CRITERIA

Just obviously solid full-term neonates conveyed vaginally who were between 38-40 weeks gestational age, weighted between 2.5-4.0kg and APGAR (Appearance, Pulse, Grimace, Activity, and Respiration) score of ≥ 7 at first and fifth minutes of life were viewed as qualified and selected into this investigation.

EXCLUSION CRITERIA

All neonates with any of coming up next were rejected: birth weight under 2.5kg or >4.0 kg, asphyxia, any inherent variation from the norm on physical examination, jaundice, clear draining issue, a family ancestry of genetic thickening issue and APGAR score of < 7 at fifth moment of life. Neonates whose moms had hypertension or potentially diabetes or were on anticoagulants like warfarin or ibuprofen were additionally avoided.

SAMPLE COLLECTION

Both composed and oral assent were gotten from the guardians previously test gathering. One milliliter (ml) of blood was gathered from a fringe vein under aseptic conditions utilizing a 23 check needle,

0.9ml of blood was put into a container containing 0.1ml of 3.2% tri-sodium citrate (i.e. in 1:9 proportion). The example gathered was tenderly rearranged 5-6 times to anticipate coagulating. The examples were taken to the research center in cooler with ice packs and spun in rotator at 2000 g for 15 min to get platelet-poor plasma inside a hour of test gathering. All blood tests were gathered inside the principal seven day stretch of life. The platelet-poor plasma was isolated and put away at - 80oC until the point that they were prepared for investigation. This is expected the way that the strength of plasma is as per the following: 4hours at 18-260C, 8hours at 2-80C, 30days at - 200C and 6months at - 700C. The whole research happens inside 7 months however the capacity of plasma at - 800C was inside 3 months. Subsequent to getting the required example measure, the solidified plasma was permitted to defrost and afterward tried for the prothrombin time, incomplete thromboplastin time with kaolin and thrombin time utilizing Coatron M2 Coagulation Analyzer made by TECO GmbH in Germany. Estimation of PT, PTTK and TT for each example was done in copies and the mean qualities recorded.

DATA ANALYSIS

Information handling was finished utilizing the Graph cushion Instat (2007) PC factual programming bundle (Version 5.00).10 Mean \pm Standard Deviation on PT, PTTK and TT were determined and reference run was built up from mean and standard deviation. One-path Analysis of Variance (ANOVA) was utilized for correlation of neonatal mean and known grown-up mean qualities in Nigeria (Source: Alao et al., 2009)¹¹ and Canada (Source: Andrew et al., 1987).⁴ All measurable examinations were at 5% dimension of criticalness, $p < 0.05$ (i.e. 95% certainty level).

ETHICAL CONSIDERATION

Endorsement for the examination was acquired from the Lagos State Health Service Commission and the Health Research and Ethics Committee of Lagos Island Maternity Hospital and Lagos University Teaching Hospital separately, authorization from the particular Head of Departments and educated assent of the guardians was additionally gotten.

DISCUSSION

In this examination, reference scope of coagulation profiles at first seven day stretch of life was resolved.

The mean PT in the main seven day stretch of life got in this examination was 13.41 ± 1.33 sec which is somewhat higher than the 12.4 ± 1.46 sec detailed by Andrew et al., 1987 at fifth day of life⁴. Federico et al., 1994 detailed a mean PT of 13.1 ± 0.9 sec among sound neonates in Trieste, Italy¹² which is like our discoveries. An investigation done in Ibadan, Nigeria by Okunade et al., 1998 likewise detailed a mean PT estimation of 15.2 ± 0.9 (14-17) sec among neonate at first day of life¹³. This mean esteem is a lot higher than our qualities. This might be identified with test measure (30 versus 200) or the age contrasts in the investigation unit. The investigation by Okunade et al., 1998 included just 30 neonates in the primary day of life while this examination included neonates in the main seven day stretch of life.

Federico et al., 1994 likewise announced a mean PT of 11.9 ± 0.6 sec among grown-ups in Trieste, Italy¹². The Mean \pm SD of PT was found to 14.04 ± 1.93 sec by Adama et al., 2013 among adults¹⁴. The mean PT among grown-ups was likewise answered to be 15.7 ± 1.6 sec by Isaac et al., 2014 which is not the same as our neonatal mean PT.¹⁵ Abdulrahman et al., 2012 revealed 14.920 ± 1.209 sec as Mean \pm SD of PT among adults.¹⁶

The reference go acquired for PT in this investigation was 10.75-16.07sec, this is like that detailed by Andrew et al., 1987 which had a reference scope of 10.1-15.9sec for solid full term newborn children in the principal day of life.⁴ In an examination by Lippi et al., 2007 ordinary estimation of prothrombin time in sound full term newborn children was likewise observed to be 11-15sec.¹⁷ Chakrapani et al., 2010 revealed 12- 17sec as reference estimation of prothrombin time in term babies¹⁸. Reverdiau-Moalic et a., 1996 revealed 1 1.4-14.0sec as reference extend in adults.¹⁹ There is thus slight variety in reference ranges from

the different examinations. This may reflect hereditary or racial contrasts, or the distinctive reagents utilized. This underlines the need to produce neighborhood neonatal reference esteems for legitimate translation of result.

The PT mean esteem we got was around 1 minute more noteworthy than that of grown-ups and this distinction was measurably critical (p -esteem < 0.0001). This mirrors the quirk of coagulation profile in neonates.

The mean PTTK in the first seven day stretch of life was 43.38 ± 6.75 sec in this examination. This esteem is nearer to that acquired by Andrew et al., 1987 (mean PTTK at fifth day of life of 42.6 ± 8.62 sec) 4; however a lot higher than the 35.0 ± 4.5 sec revealed by Federico et al., 1994 in sound full-term newborns¹². The mean esteem announced by Okunade et al., 1998 among neonates at first day of life is 47 ± 2.0 (41.50) sec¹³.

Federico et al., 1994 likewise detailed 28.8 ± 2.7 sec among grown-ups in Trieste, Italy¹². The Mean \pm SD of PTTK among grown-ups was found to 34.20 ± 7.91 sec by Adama et al., 2013. The mean PTTK among grown-ups was accounted for to be 36.3 ± 3.5 sec by Isaac et al., 2014 which is not quite the same as our neonatal mean PTTK.¹⁵ Abdulrahman et al., 2012 announced 41.380 ± 4.295 sec as Mean \pm SD of PTTK among adults.¹⁶

The reference go got for PTTK was 29.88-56.88sec. Andrew et al., 1987 announced a reference scope of PTTK in solid full term babies to be 31.3– 54.5sec in the primary day of life which is nearer to our result⁴. Lippi et al., 2007 detailed lower maximum limit (30-40sec in sound full term babies) contrasted with our discoveries in this study¹⁷. Chakrapani et al., 2010 announced a PTTK reference estimation of 25– 45sec which is lower than our findings¹⁸. Reverdiau-Moalic et a., 1996 revealed 25-39sec as reference extend in adults.¹⁹

The mean PTTK in the first seven day stretch of life in this examination was essentially higher than qualities detailed in grown-up studies.^{4,11} This demonstrates a few contrasts between mean estimations of coagulation profile among neonates and grown-ups and this might be because of the way that most coagulation factors in the natural pathway are bring down in neonates contrasted with the adults.²⁰

The mean TT at first seven day stretch of life was 24.01 ± 3.03 sec in this examination which is like that acquired by Andrew et al., 1987 where the mean TT at fifth day of life was 23.1 ± 3.07 sec⁴. Andrew et al., 1987 additionally detailed 25.0 ± 2.66 sec as Mean \pm SD of TT among adults⁴. Our reference scope of TT was anyway higher than that announced by Lippi et al., 2007¹⁷ in sound full term babies (17.95-30.07sec. versus 15-20sec). Reverdiau-Moalic et a., 1996 announced 12-16sec as reference go in adults.¹⁹

The distinction between the neonatal mean qualities and those of grown-ups may be because of the anatomical and physiological contrasts among neonates and grown-ups. **CONCLUSION**

Reference extends in coagulation profiles are one of a kind in neonates and grown-up reference scopes of PT, PTTK and TT may not be valuable in overseeing neonates in the primary seven day stretch of life. In this manner, it is fitting to build up Neonatal reference scope of coagulation profiles in our networks.

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