Euro Pathology 2018: Intra and Post Circumcision Bleeding in Nigerian Neonates: Correlation with Hemostatic Parameters - Clyde Wilson, - Department of Pathology, King Edward VII Memorial Hospital, and Bermuda.

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Introduction:

Circumcision remains the most common surgical procedure in the world, including in Nigeria and the United States. The existence of bleeding disorders and their family occurrences was noted in the medical literature from the 16th century as well as in the writings of the Talmud. Despite the high circumcision rate of 87% in Nigeria, there is little knowledge about the frequency and frequency of post-circumcision bleeding. The circumcision rate in Nigeria is much higher than the global average rate of 25 to 33%. Hemorrhage is known to be the most common complication associated with circumcision in healthy male children with an incidence of 0.1 to 35%. The human hemostatic system is dynamic and is influenced by the age of the individual. The plasma concentrations of proteins involved in hemostasis are significantly lower in newborns compared to levels in adults. Although hemostatic mechanisms are not entirely optimal in newborns, the term healthy newborn barely bleeds because of this. Hemostatic parameters such as PT and aPTT depend to a variable extent on the gestational and postnatal age of the child. Despite the lower levels of coagulation factors, PT and aPTT are only slightly prolonged compared to normal adult levels; PT 14-16 sec, aPTT 45-50 sec [7] in healthy Nigerian newborns. Factors II, VII, and IX and X which require vitamin K for the final stage of carboxylation of glutamyl gamma in their synthesis are reduced in the first 3-4 days after birth. Late hemorrhagic disease of the newborn or deficiency in acquired prothrombin complex occurs 2 to 12 weeks after birth due to vitamin K deficiency. The number of platelets in term and premature infants is between 150 and 400 x 109 / L, comparable to adult values.

It is customary in Africa, especially in Nigeria, to circumcise all male infants after the 7th day of life. Male circumcision is often performed in south-western Nigeria as a routine, crossing social, ethnic and religious barriers without prior coagulation screening tests. Babies are presented to the hospital the morning of surgery and are discharged home within one hour of surgery. This study was undertaken to regulate the correlation between intra- and post-circumcision bleeding and the hemostatic parameter in newborns, thereby determining the relevance of a laboratory investigation before circumcision to reduce the incidence of post-hemorrhagic complications.

Materials and Methods

It was a cross-sectional study in a hospital environment. The population studied came from University College Hospital (UCH) and Our Lady of Apostles Hospital (OLA), both in Ibadan, Nigeria. The study proposal was approved by the UI / UCH institutional review committee in Nigeria (IRC protocol No. UI / IRC / 04/0102). Informed consent was obtained from all mothers before collecting samples from their male infants.

A total of 3.8 ml of venous blood was taken from each male newborn immediately before the circumcision of the superficial veins on the back of the hand. 2 ml were dispersed in a sample vial of ethylene diamine sodium tetra acetate (EDTA) for a complete blood count and 1.8 ml was added to 0.2 ml of 3.2 M trisodium citrate to factor VIIIc, PT and aPTT. The complete hemogram was analyzed using the ADVIA 60 automated closed tube hematology system (TA9-92161E00) manufactured by Bayer®. Factor VIIIc, PT and aPTT were treated using standard manual procedures with the commercial thromboplastin reagent (lot number 0001702088) and the aPTT reagent (lot number 0015601078).

The method of circumcision recycled by the surgeon (UCH) Gomco clamp or the nurse (OLA) plastibell for

each of the subjects were influenced by the method routinely employed by either institution at the time of the study. The methods of Gomco clamp and plastibell use were followed strictly by the surgeon and the nurse performing the procedure. Anesthesia (dorsal penile nerve block or topical anesthetic cream) was not used on any of the infant though suture materials were provided in case of bleeding complication. Intra operative blood loss was assessed during surgery by the surgeon or the nurse performing the procedure using the weight of the blood soaked gauze (average sized plain gauze soaked with 5 ml of blood weighed approximately 5.3 kg). Post-operative bleeding was evaluated by the social worker during the home visits within the follow up period using the same method. A moderately severe bleed is blood loss superior than 10 ml of blood calculated from the weight / number of specific gauze used intra and post-operatively.

Results

A total of 244 male infants under 28 days of age were recruited for the study. None of the infants had a family history of bleeding disorders. All infants had a hematocrit value between 48 and 58 percent and a platelet count of 163 to 394 x 109 / l which fell within the normal reference range. One hundred ninety-eight (81.1%) of the infants bleed minimally (<10 ml), forty-five (18.4%) had intraoperative bleeding> 10 ml during the procedure. However, one (0.4%) of infants (Gomco forceps method) bleed severely (> 30 ml) during surgery, which justifies their admission and observation for 24 hours after surgery. This child had normal INR and aPTT values.

The majority (97.5%) of circumcised children had a normal international normalized ratio (INR) of between 0.9 and 1.2. The remaining 2.5%, representing 6 of the infants, had prolonged disturbed INR (1.3-3.8). Of the six infants, who had disturbed the INR values, five had minimal bleeding (<10 ml, considered normal) while only one had moderate bleeding intraoperatively (~ 10 ml).

Two (0.8%) of the infants had prolonged deranged aPTT values of 55 and 57 seconds. Both of them had normal intra operative bleeding while the neonate with aPTT value of 57 sec had moderately severe post-operative bleeding. A positive correlation was found between aPTT and post-operative bleeding, p = 0.001. However, there was no significant correlation between PT / aPTT values and intra-operative bleeding p = 0.534; p = 0.276 respectively. Out of the subjects, 4 (1.6%) had factor VIIIc level between 5-30% (Low), 39 (16.0%) had level between 31% and 50% (borderline) while 201 (82.4%) had level between 51 and 200%. Intra-operatively, 28.9% (manual method, Gomco Clamp) and 4.9% (plastibell) had moderately severe bleeding while excessive post-circumcision bleeding was found in 2.8% and 6.8% for manual methods and plastibell respectively.

Conclusion

A pre-circumcision test such as aPTT is an important screening test for the risk of post-operative bleeding. The time to partial activated thromboplastin will likely be sufficient as a hemostatic screening test to predict post-circumcision bleeding in infants.

References

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