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## Haematological Basis of 8th Day Male Child Circumcision in The Holy Bible

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### Summary

*“And he that is eight days old shall be circumcised among you, every man child in your generation, he that is born in the house, or bought with money of any stranger, which is not of your seed” Genesis 17:12 (King James Version)*

*Male circumcision is the surgical removal of the foreskin covering the penis. It is one of the oldest operations known. Circumcision is the rule rather than the exception within all Nigerian ethnic groups and religions. This review is a critical evaluation of the relationship between some haemostatic parameters, associated with circumcision of male infants. The main risk associated with this procedure include haematologic (bleeding). Several benefits of male circumcision include; medical reasons as a treatment for tight skin (phimosis), paraphimosis (inability of the foreskin to return to its original position after being pulled back, causing the head of the penis to become swollen and painful) and recurrent infection of the foreskin or Balanitis), reduction of the risk of HIV transmitting cervical HPV, improved sexual pleasure, increased penile-vaginal contact, stimulation, and marginally better staying power during penetrative sex. It is of significant medical importance that male circumcision be carried out on the eighth day after birth since the level of vitamin K is highest on this day and vitamin K plays a pivotal role in regulation and control of the important clotting factors in the coagulation pathway that helps in stopping bleeding.*

**Keywords:** Haematology, Male Circumcision. Holy Bible

### Introduction

Male circumcision is the surgical removal of the foreskin covering the penis. The foreskin is a retractable fold of skin covering the end of the penis. Male circumcision is one of the most commonly performed surgical procedures worldwide and an issue that has been the centre of considerable debate. Recently, the American Association of Pediatrics released a statement affirming that the medical benefits of neonatal circumcision outweigh the risks (*American Academy of Pediatrics, 2012; Bossio et al., 2014 and Morris, 2007*).

In 2007, the World Health Organization (WHO) estimated that globally one-third of males aged 15 years and over are circumcised, with almost 70% of those being Muslims (World Health Organization, 2007). A significant number of African males are circumcised. It is almost universally accepted among Christians and Muslims as a tribal and religious requirement (Drain et al., 2006; William et al., 2006). Among the benefits of male circumcision include; medical reasons as a treatment for tight skin (phimosis), paraphimosis (inability of the foreskin to return to its original position after being pulled back, causing the head of the penis to become swollen and painful) and recurrent infection of the foreskin (Balanitis), reduction of the risk of HIV transmitting cervical HPV, improved sexual pleasure, increased penile-

vaginal contact, stimulation, and marginally better staying power during penetrative sex.

Male circumcision is seen as a form of genital mutilation by some school of thought. There is increasing advocacy in some quarters to ban the practice (Fetus and Newborn Committee, Canadian Paediatric Society, 1996). They believe that the procedure is in conflict with the UN Convention of the Rights of the Child, which says, “Children should have the right to express their own views and be protected from traditional rituals which may be harmful to their health.” This school of thought advocates that boys should wait until they are old enough to decide for themselves.

Religious and tribal male circumcision is common for several reasons; symbolize a rite of passage into manhood or “warrior status, demonstration of pain that is the male counterpart of menstruation, birth or even hymen-breaking and to meet religious requirement. The main risk associated with this procedure include haematologic (bleeding) and the risk associated with serious allergic reaction associated with general anesthetic.

Haemorrhage has been known to be the most common complication related to circumcision in healthy male children with an incidence of 0.1-35% (Kavakli and Aledort, 1998). The human haemostatic system is dynamic and is influenced by the age of the individual. Plasma concentrations of proteins involved in haemostasis are significantly lower in the newborns compared with levels in adults. Although haemostatic mechanisms are not fully optimal in the neonates, the healthy term neonates hardly bleed due to this. Haemostatic parameters such as PT and aPTT are dependent to a varying extent on both the gestational and post-natal age of the infant. In spite of the lower levels of coagulation factors, PT and aPTT are only slightly prolonged compared with normal adult levels; PT 14-16 sec, aPTT 45-50 sec (Okunade and Essien, 1998) in healthy Nigerian neonates. Factors II, VII, IX and X that require vitamin K for final gamma glutamyl carboxylation step in their synthesis are reduced

in the first 3-4 days after birth. Late haemorrhagic disease of the newborn or acquired prothrombin complex deficiency occurs 2-12 weeks after birth due to vitamin K deficiency (Hoffbrand *et al.*, 2001). The platelet count at term and pre-term infants are between 150 and 400 x 10<sup>9</sup>/L comparable to adult values (Hoffbrand *et al.*, 2001).

The neonatal period provides a window of opportunity for circumcision because the newborn has recently experienced the considerable trauma of birth; they heal quickly and are resilient. A previous report (Okafor *et al.*, 2005) believe that circumcision in the first 12 hours of life is more advantageous so the infant is not subjected to another round of trauma and fear after full recovery from the trauma of delivery. This approach without the pre-circumcision screening with a test such as aPTT (perhaps using point of care testing) may not be without the risk of bleeding in some of these infants. Infants at risk for post-circumcision bleeding are those with bleeding disorders such as: von Willebrand’s disease and haemophiliacs. The post-circumcision bleed may be the first indication of this disorder and a screening test such as aPTT would be of considerable importance.

The Vitamin K and Thrombocin (which is a blood clotter) are the highest in a baby on his eighth day of life. The vitamins belonging to the K group are involved in the carboxylation of glutamate residues in proteins, to form gamma ( $\gamma$ )-carboxyglutamate residues (Gla-residues), typically located within Gla domains. These Gla-residues, which are usually involved in calcium binding, are essential for the function of most – if not all - known Gla-proteins (Furie *et al.*, 1999). Vitamin K is essential for the function of several proteins involved in blood coagulation (prothrombin, also known as factor II, factors VII, IX, and X, protein C, protein S, and protein Z) (Brenner *et al.*, 2009), bone metabolism (osteocalcin, periostin and matrix Gla protein), as well as vascular biology, cell growth, and apoptosis (growth-arrest-specific gene 6 protein) (Shearer, 2009 and Cranenburg *et al.*, 2007). A poor vitamin K status is,



therefore, currently regarded as a risk factor for bleeding.

The pivotal importance of vitamin K in haemostasis arises from the fact that all vitamin K-dependent coagulation factors require  $\gamma$ -carboxylation of glutamic acid residues at their Gla domains to enable binding of calcium and attachment to phospholipid membranes. This enzymatic reaction is catalysed by a microsomal, vitamin K-dependent enzyme,  $\gamma$ -glutamyl carboxylase, which in turn is linked to a cyclic salvage pathway known as the vitamin K epoxide cycle. This carboxylation process necessarily requires a functional vitamin K cycle to produce the active vitamin K co-factor (vitamin K quinone) for the  $\gamma$ -carboxylase which post-translationally modifies the precursors of the vitamin K-dependent proteins. When the cyclic inter-conversion of vitamin K to its 2,3 epoxide is blocked, as in the case of oral anticoagulant therapy with coumarin derivatives, the net effect is the appearance in plasma of coagulation factors called PIVKA (Protein Induced by Vitamin K Absence), which are virtually non-functional for the clotting process (Lippi *et al.*, 2009).

### Conclusion

Conclusively, it is of medical importance that male circumcision be carried out on the eighth day after birth since the level of vitamin K is highest on this day and vitamin K plays a pivotal role in regulation and control of the important clotting factors in the coagulation pathway that helps in stopping bleeding.

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