

Umbilical Cord Care in the Newborn Infant

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Summary:

Background: The umbilicus, before and shortly after sloughing of the cord, can be a source of infection or toxicity. The infection can be severe, such as septicaemia or tetanus neonatorum.

Method: Mothers of 200 neonates seen at the Children Welfare Hospital, outpatient department, Baghdad, and at Al-Takia health centre, Baquba, were interviewed about the separation of the umbilical stump and the care of the umbilicus after delivery at home or hospital, in the period, January to July 2003, excluding March and April, the time of active military invasion of the country.

Results: For occlusion of the cord a plastic clamp was used in all hospital deliveries, and 80% of home deliveries. A cotton thread or a surgical silk were used for the others. The stump separation was as early as the second day after birth or as late as the 25th day, but it was most commonly on the seventh day after birth. (Mean 9.5 +/- SD 10.5) A variety of substances were applied to the umbilicus, included azarcon, alcohol, kohl, and charcoal. Almost forty per cent of the mothers did not receive any tetanus toxoid.

Conclusion: Mothers may be assured that occasionally a normal stump separation may be as late as 25th day after birth. Many of the present practices at home in the care of the umbilicus may form a real risk of infection and toxicity.

Keyword: Newborn, Umbilical Care.

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Introduction:

After the umbilical cord is cut at birth, the umbilicus may become a portal of entry of infection before and after sloughing of the stump. Umbilical infection contributes significantly to the high rates of neonatal mortality in developing countries¹. Each year 500 000 infants die from neonatal tetanus, and 46 000 die as a consequence of severe bacterial infection. A substantial proportion of death from infection is due to cord infection¹. In Iraq we used to lose up to 20 000 infants every year from neonatal tetanus before the use of tetanus toxoid vaccination of pregnant women². When the umbilical cord is cut at birth, it is suddenly deprived of its blood supply. The stump soon start to dry and turn black and stiff (dry gangrene).The devitalized tissue of the stump can be an excellent medium for bacterial growth, especially if the stump is kept moist, and unclean substances are applied to it^{1, 3}. The umbilical vessels although functionally closed, but are still patent anatomically for 10 – 20 days following birth¹, thus during this interval the umbilical vessels are potential portals of entry of infection providing direct access to the blood stream^{1, 3}. After birth the umbilicus is colonized by bacteria from environmental sources, e.g., mother's vagina, her skin flora and hands of the caregiver, 4, 5. In hospital, staph. aureus is the most common colonizing agent. If the baby is kept with its mother (rooming in) the bacteria colonizing the baby come mostly from mothers normal skin flora and are predominantly non-pathogenic¹. Separation of the cord is mediated by inflammation of the junction of the cord with the abdominal wall with leucocyte

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infiltration and subsequent digestion of the cord; during which a small amount of cloudy mucoid secretion accumulate, the cord may appear moist, sticky and smelly. The cord usually slough within 2 weeks^{1, 3}. The aim of the study was to find out what sort of care was applied to the umbilical cord after birth in our community, the time of separation of the cord stump (sloughing), and what advice may possibly help to improve the care of the umbilicus in the neonate.

Method:

Two hundred mothers of newly born children were interviewed at Al-Takia health centre, Baquba and the Children Welfare Hospital, Baghdad in the period January to July 2003, excluding March and April, the time of active military invasion of the country. The questions included prenatal tetanus toxoid vaccination of the mother, site of delivery, the way the umbilical cord was occluded and cut, care of the umbilical stump and time of sloughing.

Results:

One hundred and seven infants were born at the hospital, and ninety three were born at home. The occlusion of the umbilical cord during delivery was done by a plastic clamp for all infants at hospital. In home delivery the plastic clamp was used for 75 infants (80.7%), a cotton thread was used for 11 (11.7%) and only 7 (7.6%) had their cord tied with surgical silk. (table-1) The instruments used for cutting the cord were the scissors for 91 infants (98%) during home deliveries and a used

razor blade for two infants(2%).In all hospital deliveries , scissors were used for cutting the umbilical cord .(100%).A variety of substances were applied to the umbilical stump at home or after discharge from hospital including azarcon (17.5%),alcohol (14%),charcoal (4%),kohl (3.5%),antibacterial powder (3.5%),henna (2.5%),and others.(table-2) The time for separation (sloughing) of the umbilical cord was as early as two days after birth or as late as 25 days, but the commonest days for separation were day 6 and day 7 after birth in 43% of the infants(table-3). For tetanus toxoid prophylaxis, 38.5% had none while 29% had one dose only, and 32.5% had two doses.

Table 1- Method of umbilical cord occlusion:

Method of occlusion	Home Delivery No. of children	Home Delivery Percentage	Hospital Delivery No. of children	Hospital Delivery Percentage
Plastic Clamp	75	80.7	107	100
Cotton Thread	11	11.7	--	--
Surgical Silk	7	7.6	--	--
Total	93	100	107	100

Table 2- Substances applied to the umbilical cord after delivery or after discharge from hospital:

Substance	%	Substance	%
Azarcon	17.5	Chlorhexidine	2
Alcohol	14	Chloroxlenol	1
Charcoal	4	Talc powder	1
Kohl	3.5	Cigarette ash	0.5
Antibacterial powder	3.5	Olive oil	0.5

Age in days	Home		Hospital		Total No. of children	Total %
	delivery- No. of children	deliv- ery %	delivery No. of children	delivery %		
2	1	1.3	0	0	1	0.7
3	12	15.8	6	10.3	18	13.4
4	9	11.8	8	13.8	17	12.6
5	4	5.3	9	15.5	13	9.7
6	15	19.7	5	8.6	20	15
7	25	32.9	12	20.7	37	28
8	2	2.6	6	10.3	8	6
9	1	1.3	2	3.5	3	2.2
10	6	7.9	3	5.2	9	6.7
11	1	1.3	2	3.5	3	2.2
12	0	0	2	3.5	2	1.5
16	0	0	1	1.7	1	0.7
24	0	0	1	1.7	1	0.7
25	0	0	1	1.7	1	0.7

Table 3 –Time of separation of umbilical cord stump:

Total 76 100 58 100 134*

* Babies who had their umbilical stump already sloughed, with no history of infection or catheterization.

Discussion:

Timing of clamping of the umbilical cord is still controversial and still no clear evidence to favour

one practice over the other .Delaying cord clamping until pulsation stops is the physiological way of treating the cord and is not associated with adverse effects, at least in normal deliveries¹. The cord should always be ligated or clamped to prevent excessive bleeding .The plastic cord clamps effectively close all vessels in the umbilical cord and are easy to use but are more expensive than ties¹It was used in all hospital deliveries and 80 % of home deliveries (table-1) .If ties are used, it is recommended that the tie should be at least 15 cm. in length to allow effective tying i.e. tight enough to occlude the umbilical vessels in order to prevent bleeding when the jelly shrinks and dries ¹ . In other developing countries they may use blades of grass, bark fibres, reeds or fine roots^{1, 6}. The clamp can be removed when the cord is completely dry .The cord was invariably cut by sterile scissors at hospital .At home scissors were used in 98 % of deliveries, but we were not certain about the degree of sterility. Two infants had their cords cut with used razor blades, a practice that carries the risk of infection ¹.In the decade of the seventies kitchen knives were commonly used.⁷ In other developing countries other tools for cutting the umbilical cord included knives, broken glass, stones and sickles. Using a blunt instrument could possibly result in increased incidence of infection ⁸. The time of separation of the umbilical cord stump is considered to be 5 – 10 days, occasionally it may be as late as 67 days ^{9,10} , with our infants it varied from 2 days to 25days (table- 3) Many mothers get worried if separation of the cord is delayed more than a week or ten days since the majority of infants have their umbilical stumps separated on day 6 or 7 .Delayed separation may be due to application of antiseptics to the stump e.g. alcohol, infection ,following caesarean section or the rare condition of neutrophil chemotaxis defect ^{1, 3} . The delay of cord separation with the use of antiseptics may be due to destruction of normal flora around the umbilicus with subsequent decrease in the number of leucocytes attracted to the cord ^{1, 11} In the past many people especially in rural areas used to apply cows dung on the umbilicus and this may explain the high incidence of tetanus neonatorum in certain parts of the country, with an estimated mortality of 80 % ⁷, however none of the mothers we interviewed used it for their infants. Azarcon , an orange coloured powder containing lead oxide, and kohl, a black powder that contains lead sulphide were commonly used (table – 2).These practices may carry the risk of lead poisoning ¹² . Henna was used for 2.5% of our infants, a practice that may carry the risk of hemolysis in G6PD deficient infants if enough is absorbed from the umbilicus ¹³. Other substances used in other developing countries for dressing of the umbilicus were, menthol ⁹, ash ,oil ,butter ,spices paste and herbs with increased risk of infection ,while the use of mud , cows, chicken or rat dung, and ghee may contain tetanus spores from soil

1. Caution was used in some countries to sterilize the stump and control bleeding. Colostrum use appears to have no adverse effects and associated with shorter separation time than dry care or povidone-iodine application [1, 14]. The substances applied in hospitals in developed countries included alcohol, which did not promote dryness, less efficient as an antibacterial and may delay separation of the stump [1, 5]. A dusting powder may be used containing zinc oxide, talc, starch, alum with or without hexachlorophene, or chlorhexidine. Others use antibacterial solution or ointment containing triple dye (brilliant green, proflavin hemisulphate, and gentian violet) [15], or tincture of iodine 2%, iodophor, or antibiotic ointment like bacitracin, nitrofurantoin, silver sulphadiazine, chlorhexidine, salicylate sugar powder, and others [1, 16, 17]. These may be applied once every day or after every napkin change [1]. Umbilical cord infection takes place in the first 3 days after birth. In developed countries the organisms are staph. aureus, E. coli or B. Streptococcus. In developing countries staph. aureus, Klebsiella and E. coli. Omphalitis may lead to septic emboli that are carried to the lungs, heart, pancreas or kidneys, or the infection may pass directly to the peritoneum. The use of antibacterial agents helped to control epidemics of staph. aureus infection in hospital nurseries, but some times followed by colonization with other pathogenic organisms. Antibacterials prolong the time it takes the cord to separate [1]. The practice of applying antiseptics to the cord is now common not only in hospital nurseries but outside hospitals, yet has not been thoroughly evaluated. Daily bathing or no bathing showed no difference in colonization or infection of the umbilicus. Immersion of newborn in a tub is not harmful to the cord [1]. The newborn should not be bathed routinely as it may induce hypothermia [1]. The cord should be washed when necessary with clean water and soap, and the napkin should be folded below the umbilicus. Touching the cord or applying unclean substances to it and applying bandages should be avoided. Binding the newborn abdomen with cloth or bandages keep the stump moist, thus delaying healing and increase the risk of infection [1]. Tetanus toxoid use played a remarkable role in reducing the incidence of tetanus neonatorum, as it was first introduced in Iraq in 1972. To find out how often received by mothers we found that almost 40% did not receive it, and one third had one dose. Good care of the umbilicus is important in reducing neonatal mortality and morbidity, therefore education of the public through medical centres and mass media ought to receive more attention. Birth attendants should be trained for a better care of the umbilicus in the newborn, stressing the importance of hand washing with soap and water before cutting the cord. Cord occlusion should be done with a plastic clamp or sterile tie or string, or a disposable delivery kit. The umbilical stump should be kept dry, clean, well

aerated, and the napkin to be folded below it. If the stump is soiled it may be washed with soap and water. There is no need to apply alcohol or antibacterials. The application of substances that may lead to infection or possible toxicity like azarcon, kohl, or henna should be avoided. In hospital if 24 hour rooming-in is available no antibacterials are needed for the umbilicus. Skin-to-skin contact with the mother promotes colonization with non-pathogenic bacteria from mother's skin flora. In a hospital nursery the application of iodine tincture 2% or silver sulphadiazine once a day for 3 days is recommended [1].

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