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## The normal range of separation time of the umbilical cord in Iraqi Newborn

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### Abstract

A prospective study was performed on 150 healthy term newborn babies who had been examined in postnatal ward of gynecology and obstetrics department at Al-Mahmodyia general hospital during the period from of April to December 2019. Among the total 150 surveyed cases, 71 cases were males (47%), 79 cases were females (53%). The mean time of umbilical cord separation for the male cases was 8.5 days, whereas that of the female cases was 8.3 days. In the studied newborns, the mean time of umbilical cord separation was 8.4 days, shortest documented time of separation was 4 days (3 cases) while the longest time of separation was 14 days (one case only). Most of the cases; 71 (47.33%) cases had separated the umbilical cord in the time period (>8 to 11 days), whereas the least group separated the UC in the time period (>11 days).

**Keywords:** umbilical cord separation time

### Introduction

The world health organization estimates that 4 million children die each year during the neonatal period, Importantly, infections are the most common cause of neonatal mortality, umbilical cord infections contribute to the increased morbidity and mortality in the newborns, approximately 1 million newborn dying annually worldwide from umbilical cord bacterial infections <sup>[1]</sup>.

Umbilical cord separation is initiated by thrombosis and contraction of the umbilical vessels followed by phagocyte-mediated tissue breakdown and epithelialization of the cord stump, Stump colonization by bacteria derived from the maternal genital tract or environment occurs soon after birth, and in some cases can cause umbilical infections <sup>[2]</sup>.

The normal time of Separation of the umbilical cord may vary from 2 days up to 28 days, thus it is influenced by many factors include place of delivery, gender of infants and cord care practice. Knowledge of the normal range of time it takes for separation of the cord after birth is important to prevent unnecessary and maybe harmful interventions <sup>[3]</sup>.

Delayed cord separation does not have a specific definition, primarily because of the variation in normal cord separation. In general, any cord that persists after 28 weeks probably represents delayed cord separation. Delayed cord separation can be associated with underlying immunodeficiency, infection, or urachal abnormality <sup>[4]</sup>.

Umbilical infections occur primarily in the newborn because of the following predisposing factors: after birth, colonization of the umbilicus with a diverse flora of microorganisms, Devitalized tissues of the UC stump provide an excellent growth medium for bacteria, The thrombosed blood vessels within the umbilical cord stump provide an entry for microorganisms into the bloodstream <sup>[5]</sup>.

### Patients and methods

A prospective study was performed on 150 healthy term newborn babies who had been examined in postnatal ward of gynecology and obstetrics department at Al- Mahmodyia general hospital during the period from of April to of December 2019.

At the postnatal ward; the families of the recruited newborn babies were questioned for name, sex, mode of delivery, date and time of birth, residence (whether it is rural or urban), maternal age and parity of the mother, any history of chronic medical illness, or recent fever or leaking liquor or early rupture of membrane, being a term baby has been confirmed from the last menstrual period and expected date of delivery of the mother which were

documented in the mother's medical records. All the involved newborns were examined by the researcher for their weight, possible presence of gross congenital abnormalities (for the latter, to be dismissed from the study initially) and finally the length of umbilical cord stump for each examined newborn has been measured by the researcher. The length was measured by disposable tongue depressor (depending on the previously measuring width of it of 1.5 cm)

A phone number of the closest caregiver of the included newborn has been taken in order to contact them to question about the time of separation of the umbilical cord, mode of care of the umbilical cord (its preference of choice was left for the caregiver's desire and will), the phone calls were used to be done every 5 days till the onset of separation of the umbilical cord (at this point, the candidate wouldn't be followed up any more).

**Results**

The total surveyed newborns were 150.

**Time of separation of umbilical cord**

In the studied newborns, the mean time of separation was

8.4 days, shortest documented time of separation of umbilical cord: was 4 days (3 cases) while the longest time of separation was 14 days (one case only).

Most of the cases; 71 (47.33%) cases had separated the umbilical cord in the time period (>8 to 11 days), whereas the least group separated the umbilical cord in the time period (>11 days) (table-1).

**Table 1:** Distribution of cases according to time of separation of the cord Time (days) 3 to 5, >5 to 8, >8 to 11, >11

Time (days)	3 to 5	> 5 to 8	> 8 to 11	> 11
No. of case	12	60	71	7
Percentage	8%	40%	47.33%	4.5%

**Impact of newborns sex on the time of separation of the umbilical cord**

Among the total 150 surveyed cases, 71 cases were males (47%), 79 cases were females (53%). The mean time of separation for the male cases was 8.5 days, whereas that of the female cases was 8.3 days.

The results showed that the sex of the newborn has no impact on the time of separation of the umbilical cord: with a P-value equal to 0.086 (table-2).

**Table 2:** Distribution of newborns sex categories into time of separation of umbilical cord.

Sex	No.	Distribution of cases according to the time of separation of the umbilical cord (in days)				Mean time	P-value
		3 to 5	>5 to 8	>8 to 11	>11		
Male	71	7 10%	21 30%	40 56%	3 4%	8.5	0.086
Female	79	5 6%	39 50%	31 39%	4 5%	8.3	
Total	150	12	60	71	7	8.4	

**Impact of birth weight on the time of separation of the umbilical cord**

The vast majority of cases (137 cases (91%)) were born with body weight ranging from 2.5 to 4.5 kg with a mean time of separation of the umbilical cord equal to 8.4 days, only 7 cases (4%) were born with body weights < 2.5 kg,

their mean time of separation of the UC was 8.8 days, the rest 6 cases (4%) were born with body weights >4.5 kg with a mean time of separation equal to 7.9 days (table-3).

According to statistical testing, the birth weight has no significance influence on the time of separation of the umbilical cord (P-value: 0.533).

**Table 3:** Distribution of newborn's body weights categories into time of separation of umbilical cord.

Birth weight	No.	Distribution of cases according to the time of separation of the umbilical cord (in days)				Mean time	P-value
		3 to 5	>5 to 8	>8 to 11	>11		
<2.5 g	7	0 0%	1 14%	5 72%	1 14%	8.4	0.533
2.5 – 4.5 Kg	137	12 9%	56 41%	63 44%	6 4%	8.7	
>4.5	6	0 %	3 50%	3 50%	0 0%	8.2	
Total	150	12	60	71	7	8.4	

**Impact of mode of delivery of the newborns on the time of separation of the umbilical cord**

In the present study, 124 cases (83%) were delivered by cesarean section, their mean time of separation of the umbilical cord was 8.5 days, the rest; 26 cases (17%) were

delivered vaginally with a mean time of separation equal to 8.2 days (table-4). According to the statistical finding; mode of delivery of the newborn has no influence on the time of separation of the umbilical cord (P-value: 0.992) (table-4).

**Table 4:** Distribution of mode of delivery categories into time of separation of umbilical cord.

Mode of delivery	No.	Distribution of cases according to the time of separation of the umbilical cord (in days)				Mean time	P-value
		3 to 5	>5 to 8	>8 to 11	>11		
Cesarean section	124	10 8%	49 40%	59 47%	6 5%	8.5	0.086
Vaginal delivery	26	2 7.5%	11 42.5%	12 46%	1 4%	8.3	
Total	150	12	60	71	7	8.4	

**Discussion**

As mentioned previously in this study, the range of umbilical cord separation time was 4 to 14 days with no odd cases of much longer time period of separation, the demonstrated range is similar to that of Yola, Iliyasu *et al.* in

Nigeria study [6], while it is considered short in comparison to other studies; time range of separation in study of Singh and Sharma *et al.* in India was 3-31 days, that of Oladukon and Orimadegun *et al.* in India was 3-21 days [7], while the time range in Helen Bailey study in Canada was 2-28 days.

The relatively narrow range in the current study could be explained due to larger samples size in the corresponding studies ((250 cases) (536 cases) (233cases) respectively for the later three study) which were carried out by recruited medical teams.

The mean time of separation of the umbilical cord was 8.4 days, which was similar to that of Tudu, Mishra *et al.* study in India (mean time of 8.6 days) [8], while it was longer than the time of separation In Lokesha, Anil *et al.* study in India (mean time of 5.6 days) [9] whereas it was shorter than that of Novack, Mueller *et al.* in America (mean time 13.9 days) and Medves, Beverley *et al.* in Canada (mean time of 13.8 days) [10].

The latter difference might be due to high hygiene level in the developed countries leading to possible less bacterial colonization of umbilical cord and subsequently delayed dryness and fall of umbilical cord [7], also climate variation between the developed and developing countries may contribute to that difference; where is the atmosphere tends to be colder in the western and northern countries leading to more clothing of newborns resulting in interference and decreasing the certain air exposure which required for the dryness and the subsequent separation of the umbilical cord. An attempt to study the influence of the newborn sex, the results showed that it had no impact, which was the same outcome in study of Aghamohammadi, Zafari *et al.* [11] and in that of Lokesha, Shetty *et al.* [9] and study of Quattrin, Iacobucci *et al.* [12].

The collected data showed that the newborns' birth weight had no effect on the time of separation of the umbilical cord which was compatible with other studies like; Lokesha, Shetty *et al.* [9], Ozdemir and Bilgen *et al.* [13].

Regarding the mode of delivery, the results show 83% of cases were delivered by cesarean section?? And less than 17% cases were delivered vaginally. Overall, the present study showed that the mode of delivery had no influence on the time of separation of umbilical cord, which was the same outcome in many studies, like; Aghamohammadi, Zafar *et al.* [11], Ozdemir and Bilgen *et al.* [13], Yola and Iliyasu *et al.* [6].

In contrast; certain studies, like: Oladukon and Orimadegun *et al.* [7] and Helen bailey study had shown that the cesarean section was associated with longer separation time, thus, may be due to Decrease in bacterial contamination (that occurs normally in vaginal deliveries) leading to lower rate of leukocytes migration and subsequent delay in dryness and separation of the umbilical cord [7].

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