

The duration of the third stage of labor and related factors

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ABSTRACT

Background: Third stage of labor has been defined as the most dangerous stage. Due to the importance of the third stage, this study was performed in order to determine its length and related factors.

Materials and Methods: This research is a cross sectional study which was carried out on 1000 deliveries in Shabihkhani Hospital (Kashan-Iran). Inclusion criteria consist of gestational age of higher than 20 weeks, singleton pregnancy, and vaginal delivery without any instrument.

Findings: The mean, median and standard deviation of the third stage of labor were 6.03, 5 and 5.15 minutes respectively. The finding also showed that there was a significant association between Para, Induction of labor, use of analgesic drugs during labor (pethidin), and umbilical drainage for third stage management ($p < 0.05$). There was no significant association between a history of Abortion, Gestational age and Third stage management (Oxytosine).

Conclusions: The use of Induction, analgesic drugs during labor and umbilical drainage prolonged the third stage of labor, but multiparity decreased the duration of this stage. The diagnosis of these factors is recommended in order to predict and prevent the occurrence of the third stage dangers.

Key words: Labor stage, third stage, placenta delivery, normal vaginal delivery, postpartum hemorrhage

INTRODUCTION

The third stage of labor which starts with the delivery of the fetus consists of the two phases of separation and exit of placenta. Defective separation of the placenta leads to the separation of blood sinuses and consequently postpartum hemorrhage (PPH).^[1] The prolonged third stage of labor is considered as the most important factor of PPH and excessive bleeding; therefore, different time intervals are set to diagnose the abnormal state of placenta and the possibility of PPH.^[2]

PPH is a leading cause of maternal morbidity and mortality. More than 99% of maternal deaths occur in poor countries, while 30% of these deaths are attributed to the excessive blood loss commonly known as PPH.^[3]

The common cause of delayed placenta delivery can be attributed to postpartum hemorrhage, inadequate uterine contraction, chorioamnionitis, and abnormal placenta attachment such as placenta accreta, increta and succenturiate lobe.^[2,4]

Past researches have revealed that the average duration of the third stage of labor is between 6-7 minutes.^[5,6] Factors that can influence this time interval need to be studied. The number of pregnancies and labors,^[7] abortions,^[8] nulliparity,^[5] method of induction and the use of

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pethidine as analgesia during labor [7] are the factors that might prolong the third stage of labor. However, some studies showed that either these factors had no relationship with this stage or that some might decrease the duration of the third stage of labor.[9-5] Considering the ongoing debate on this issue, the current study was designed to determine the duration of the third stage of labor and its associated factors.

MATERIALS AND METHODS

This was a cross sectional study on a 1000 subjects with normal vaginal deliveries (NVD) in Kashan Shahbikhani Hospital from December 2005 to February 2007. This study was approved by the ethics committee of Kashan University of Medical Sciences. The inclusion criteria were single pregnancy, gestational age of more than 20 weeks and vaginal delivery without any instrument. The exclusion criteria were placenta previa, placenta abruption, multiple pregnancies, polyhydramnios, abnormal placental adhesions, a previous uterine scar, previous cesarean, and coagulation disorders.

A checklist was used for data collection. The content validity of the check list was confirmed by Midwifery and Gynecology faculty members. A trained delivery agent recorded the duration of the third stage by using a stopwatch. The third stage of labor was defined as the period of time from birth of the neonate until the delivery of the placenta. Numbers of deliveries, previous abortion, gestational age, induction of labor, using pethidine as analgesia during labor, using oxytocin in the third stage and placental cord drainage were also recorded. The patients were divided into two groups according to the duration of the third stage: less than or

equal to six minutes (group I), and more than six minutes (group 2) as the prolonged third stage.[5] Statistical data analysis were done using χ^2 , OR and CI tests.

FINDINGS

In this study, the mean age of women was 25.77 (SD = 5.54) years. Most of the women were in their first pregnancies (43.3%), with the remainder in their second (28.5%), and third or more pregnancy (28.2%). Nearly one half of the women were primiparous (49.6%). The median gestational age at the time of delivery was 39.32 (SD = 1.31) weeks (33-42 weeks).

The average duration of the third stage of labor was 6.03 ± 5.15 minutes (minimum 1 and maximum 60 minutes). The median of this stage was 5 minutes. 736 subjects (73.6%) had a third stage of less than or equal to 6 minutes (group I) and 264 subjects (26.4%) had a third stage of more than 6 minutes (group 2) (table-1). The factors related to the duration of the third stage of labor are shown in table-2. 49.6% of the patients were primipara and 83.4% had no history of miscarriage. 90.8% had the gestational age of 37 weeks or more. 84.5% of the patients received labor pain stimulation and analgesics were used in 74.6% of the patients. Ninety eight percent of the cases received oxytocin in the third stage of labor and cord drainage was used in 14.4% of the patients.

Table 1. Duration of the third stage of labor

Third stage duration	Frequency	
	Number	Percentage
Less than or equal to 6 min	736	73.6
More than 6 min	264	26.4
Total	1000	100

Table 2. Related factors to the duration of the third stage of labor

Related factors		Third stage of labor		P value	OR CI		
		≤6	>6				
	No.	Percentage	No.	Percentage			
Pariety	1	351	70.8	145	29.2	0.04	-
	2	212	75.4	69	24.6		
	≥3	173	77.7	50	22.3		
History of Abortion	Yes	129	77.7	37	22.3	0.188	-
	No	607	72.8	227	27.2		
Gestational Age	< 37	66	71.7	26	28.3	0.671	-
	≥ 37	670	73.8	238	26.2		
Induction	Yes	606	71.7	239	28.3	0.002	2.05 1.3-3.27
	No	130	83.9	25	16.1		
Analgesia (pethidin)	Yes	533	71.4	213	28.6	0.008	1.59 1.12-2.24
	No	203	79.9	51	20.1		
Use of oxytocin	Yes	718	73.3	262	26.7	0.09	-
	No	18	90	2	10		
Cord drainage	Yes	85	59	59	41	0.001	2.2 1.52-3.18
	No	651	76.1	205	23.9		
	Female	335	73.5	121	26.5		

analgesics during labor ($p = 0.008$) and cord drainage ($p = 0.001$). In the present study, no significant relationship was found between the duration of the third stage of labor and the number of deliveries ($p = 0.04$), stimulation of labor ($p = 0.002$), using relationship was found between the duration of the third stage and a history of abortion, gestational age and use of oxytocin in the third stage of labor.

DISCUSSION

The mean and median of the third stage of labor were 6.03 and 5 minutes respectively. The same results can be seen in other studies.^[5] In an investigation by Magann et al. the median length of the third stage of labor was 7 minutes (minimum 2, maximum 120 minutes). The mean of the third stage in women with PPH was 9 minutes while the duration was 7 minutes in women with no bleeding.^[6]

Based on the findings of this study, labor stimulation had a correlation with the increasing probability of a long third stage of labor. Other studies did not confirm this finding.^[9] Based on the findings of Soltan and Khashoggi^[7] induction of labor pain had correlation with a prolonged third stage of labor and retained placenta. In a case-control study the same correlation was reported which was in accordance with the present study.^[5] Oxytocin increases the uterine activity during labor; this may cause fatigue and the possibility of atony and might lead to the prolongation of the third stage. The findings of the present study showed that there was no significant relationship between the third stage of labor and the gestational age. The reports of Panpaprai and Boriboonthirunsarn also showed that these two factors were not related.^[9]

Preterm delivery has been reported as the risk factor for prolongation of the third stage of labor.^[6] This correlation was not found in this research. This may be due to the lack of NICU facilities in the hospitals and them not accepting pregnant women with a low gestational age. The mean age in the preterm group was 36.17 weeks, the results of which were not significant.

49.6% of the deliveries were in the first stage, and 28.1% were in the second stage of delivery. Primiparous women had a longer third stage in comparison to multiparous women. Combs and Laros's study supported this finding and showed that primiparity can be one of the factors related to the prolongation of the third stage.^[5] Hence, the policy of waiting for the third stage in this group of women should be reevaluated in order to prevent the risk of retained placenta.

The present study showed that abortion and the third stage of labor were not related. The study of Panpaprai and Boriboonthirunsarn supported this finding.^[9] However, the study of Zhou et al. has found a weak correlation between the third stage of labor and the history of two or more abortions.^[8] The reason to this correlation not being significant in the current study could be that only 16.6% of the subjects had a history of abortion and the majority of them (91%) had only one abortion.

The findings of this study showed that using pethidine as analgesia in the third stage of labor could increase the length of this stage. Panpaprai and Boriboonthirunsarn's study did not support this finding.^[9] Moreover, some researchers believed that an appropriate dose of pethidine would accelerate the placenta extraction.^[10] However, a case-control study in Saudi Arabia showed that using pethidine during labor was an effective factor in the prolongation of the third stage and retained placenta,^[7] which was in accordance with the results of the present study. Pethidine does not reduce the uterine activity; on the contrary, it may increase this activity, due to the reduction of epinephrine and other catecholamines.^[10] Since, one of the most important reasons of the uterine atony is the increase of the uterine activity before the delivery,^[1] this could be a reason to the delay in placenta extraction after using the pethidine.

In this study there was no correlation between using oxytocin in the third stage and its duration. However, Jerbi et al. recommended the use of oxytocin in order to shorten the third stage and prevent PPH and blood loss in spite of its side effects, such as nausea and vomiting.^[11] Jackson et al. have not observed any significant correlation between managing the third stage of labor with oxytocin, and the length of this stage.^[12]

Based on the findings, the frequency of a third stage longer than 6 minutes was higher in patients who had cord drainage (41% and 23.9% respectively). Giacalone et al. also showed the same result.^[13] Sharma et al. found no correlation between cord drainage and the duration of the third stage of labor.^[14] However, Armbruster and Fullerton showed that cord drainage could reduce the length of the third stage.^[15] Soltani et al. also believe there is a small reduction in the length of the third stage of labor when cord drainage is applied.^[16] This is a controversial issue and a meta-analysis study on clinical trials, suggested that because of different findings and an inadequate amount of research on cord drainage and its relationship with the length of the third stage of labor, more research in this area is necessary.^[17]

CONCLUSION

The average duration of the third stage of labor was 6.03 minutes which was close to the findings of other studies. Use of labor stimulation, analgesia during labor, and cord drainage were recognized as factors related to the prolongation of the third stage. Increase in the number of deliveries was also related to the shortening of the third stage. Awareness of these factors seems necessary in order to predict the prolongation of the third stage of labor and prevent its consequences. However, considering the controversial results of some risk factors, such as cord drainage, more studies are recommended in this field.

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