ORIGINAL ARTICLE

Study of Second Stage Partogram in Detection of Abnormalities of Second Stage

Farhana Giri[1], Misbah Shawl[2], Shazia Bashir[3], Rizwana Habib[4], Rassieq Aslam[5]

Received on: 15 October 2022; *Accepted on:* 13 December 2022; *Published on:* 06 March 2024

Abstract

The second stage of labor is critical as well as prime as it affects the maternal and perinatal outcome in the form of risk of prompt hypoxic fetal stress and perineal maternal trauma. The aim of optimizing the second stage management is to understand and rectify the association between the uterine contractions, fetus, and birth canal to reduce the maternal and perinatal complications.

Background: Emphasis has been laid on the first stage of labor using partogram and on the third stage of labor, including active management of labor, to provide habile care and decrease complications of the second stage of labor have been ignored.

Methods: Once full dilation was achieved, per vaginal examination was done after proper consent. Position and station of head was noted and scored. After 30 minutes, per vaginal examination was repeated and position and station was noted, and then at 15 minutes till delivery.

Results: Second stage partogram helps us to early detect the abnormal progress of second stage and to intervene early in terms of augmentation of labor or operative vaginal delivery and prevent maternal and fetal complications.

Conclusion: Second stage partograph may help to prognosticate obstetric and perinatal outcome by using variables, such as station and position of head.

Keywords: Duration of labor, Second stage partogram, Second stage partogram score.

Journal of South Asian Federation of Obstetrics and Gynaecology (2024): 10.5005/jp-journals-10006-2365

Introduction

The second stage of labor begins with complete cervical dilation and includes passive and active phase till expulsion of fetus.[1] The second stage of labor is critical as well as prime as it affects the maternal and perinatal outcome in the form of risk of prompt hypoxic fetal stress and perineal maternal trauma. The aim of optimizing the second stage management is to understand and rectify the association between the uterine contractions, fetus, and birth canal to reduce that maternal and perinatal complications.[2] Abnormal labor patterns in the first and second stages are defined as either protraction or arrest disorder. Protracted labor stages indicate that labor is progressing at slower pace than expected. Arrest disorder indicates the complete cessation of the progress of labor. Prolonged latent phase is defined as a latent phase of greater than 20 hours in nullipara and greater than 14 hours in multipara.[3] The second stage in nullipara is limited to 2 hours and extending to 3 hours when regional analgesia is used. For multipara, 1 hour is the limit, extended to 2 hours with regional analgesia.[4] Cephalopelvic disproportion, abnormal fetal position, and bony abnormalities of the pelvic inlet and mid cavity (i.e., prominent ischial spines) are the main problem involving fetus during the second stage of labor. The risks of prolonged labor are dehydration, electrolyte imbalance, infections, increased operative delivery, postpartum hemorrhage, trauma, hypoxia, meconium aspiration syndrome, fetal distress, and still birth.[5]

The partograph is a simple tool that has been used for this purpose.[6] Partograph or partogram is accepted as the gold standard for monitoring labor and is used for monitoring active labor as recommended by the World Health Organization (WHO).[7] Monitoring progression, identification, and then intervention are the main functions of partograph.[8] It is a graphical record of labor, which is inexpensive, easily available tool endorsed by the WHO for monitoring of labor.[9] Emphasis has been laid down on the first stage of labor using partogram and on the third stage of labor, including active management of labor, to provide habile care and decrease complications of second stage of labor have been ignored.[10] Once full dilation is reached, the graphically information of partograph stops; hence, no information regarding abnormal pattern of second stage is obtained, and graphical display of events during the second stage of labor may become essential especially when the second stage of labor gets lengthened.[11] This will help us to detect early the abnormalities of second stage of labor specially prolonged and obstructed labor and timely intervention thereafter.

The second stage of labor has two important variables: descent of head and position of head. Sizer et al.[11] first time used the second stage partogram by developing a scoring system based on fetal head descent (station) and position. On per vaginal examination, score

[1–4]Department of Obstetrics and Gynecology, Government Medical College, Srinagar, Jammu and Kashmir, India

[5]Department of Radiology, Government Medical College, Srinagar, Jammu and Kashmir, India

Corresponding Author: Shazia Bashir, Department of Obstetrics and Gynecology, Government Medical College, Srinagar, Jammu and Kashmir, India, Phone: +91 6005892569, e-mail: shaxia172011@gmail.com

How to cite this article: Giri F, Shawl M, Bashir S, *et al*. Study of Second Stage Partogram in Detection of Abnormalities of Second Stage. J South Asian Feder Obst Gynae 2024;16(Suppl 1):S16–S19.

Source of support: Nil

Conflict of interest: None

was allotted to the position and station of head. All the scores were summed up and were plotted against time graphically. The line on the right of the nomogram is considered abnormal and is associated with prolongation of second stage and requires early intervention.[11]

Aims and Objectives

- To detect the abnormalities of second stage of labor early and timely intervention.
- To study the efficacy of second stage partogram in progress of second stage of labor and obstetric outcome.
- Maternal and perinatal outcome in relation to the second stage duration (SSD).

Materials and Methods

The present observational study was conducted in the Postgraduate Department of Obstetrics and Gynaecology, Lalla Ded Hospital, an associated hospital of Government Medical College, Srinagar over a period of one and a half year. Ethical clearance was obtained from the Institutional Ethical Committee.

Inclusion criteria

- Full-term pregnancy >37 weeks.
- Fully dilated cervix.
- Singleton pregnancy.
- Cephalic presentation.
- Primi or multi.
- No contraindication to normal vaginal delivery (NVD).

Exclusion Criteria

- Preterm <37 weeks pregnancy.
- Not fully dilated cervix.
- Multiple fetus.
- Any malpresentation (breech, brow, face).
- Previous scar lower (uterine) segment caesarean section (LSCS).
- Any contraindication to NVD.

Method of Doing

Once full dilation was achieved, per vaginal examination was done after proper consent. Position and station of head was noted and scored. After 30 minutes, per vaginal examination was repeated, and position and station was noted, and then if possible and if patient agreed to it, at 15 minutes till delivery. The time of delivery was recorded, and length of the second stage was calculated. The method of delivery, Apgar score at 1 and 5 minutes, and any intervention required were recorded.

On per vaginal examination, score was allotted to the position and station of head.

Position

- Occiput anterior (OA) 2
- Occiput transverse (OT) 1
- Occiput posterior (OP) 0

Station

- Higher than ischial spines 0
- At spines 1
- Below spines 2

Maximum score of position and station 4

Table 1: Distribution of study patients as per parity

Parity	*Number*	*Percentage*
Primi	206	51.5
Multi	194	48.5
Total	400	100

Table 2: Age distribution of study patients

	Primi		*Multi*		
Age (Years)	*No.*	*Percentage*	*No.*	*Percentage*	*p-value*
20–24	16	7.8	2	1.0	<0.001*
25–29	172	83.5	74	38.1	
30–34	16	7.8	85	43.8	
≥35	2	1.0	33	17.0	
Total	206	100	194	100	
Mean ± SD	26.8 ± 2.14		30.7 ± 3.74		

*Statistically significant (*p*-value < 0.05)

Table 3: Distribution of study patients as per first stage of labor

	Primi		*Multi*		
First stage of labor	*No.*	*Percentage*	*No.*	*Percentage*	*p-value*
Spontaneous labor	100	48.5	135	69.6	
Induced labor	106	51.5	59	30.4	<0.001*
Total	206	100	194	100	

*Statistically significant (*p*-value < 0.05)

Pluse

- If anal dilation is visible score allotted 5
- At delivery score allotted is 6

All the scores were summed up and were plotted against time graphically. Intermittent auscultation and cardiotocography (CTG) monitoring of fetus was continuously performed to detect fetal distress and monitor fetal heart rate. Any second stage on or to the right side of graph was considered abnormal. The initial score at the diagnosis of second stage was used as predictor of duration of second stage, mode of delivery, and early identification of increased risk of delivery. The neonatal outcome was included by calculating Apgar at 1 and 5 minutes.

Results and Observations

Around 51.5% of our study patients were primigravida and 48.5% were multigravida (Table 1).

The patients were segregated into four age groups: 20–24, 25–29, 30–34, and >35 years having different percentage of multigravida and primigravida as mentioned in Table 2.

Significant correlation was found between parity and type of labor (Table 3). The 51.5% primi had induced labor and 48.5% had spontaneous labor, while as 69.6% multi had spontaneous labor and 30.4% had induced labor.

Significant correlation was found between parity and statutory sick pay (SSP) score (Table 4). Around 37.9% primi and 27.3% multi had SSP <3, while 62.1% primi and 72.7% multi had SSP ≥3.

Figure 1 shows the significant correlation of duration of second stage of labor on fetal outcome was observed on 1 minutes Apgar <7, 5 minutes Apgar score <7, birth asphyxia and neonatal intensive care unit (NICU) admission with a $p < 0.05$.

Figure 2 shows that the percentage of third degree tears for <30 minutes, between 30 and 60 minutes, and >60 minutes was

Table 4: Distribution as per second stage partogram score among study patients

	Primi		*Multi*		
Score	*No.*	*Percentage*	*No.*	*Percentage*	*p-value*
<3	78	37.9	53	27.3	
≥3	128	62.1	141	72.7	0.025*
Total	206	100	194	100	

*Statistically significant (*p*-value < 0.05)

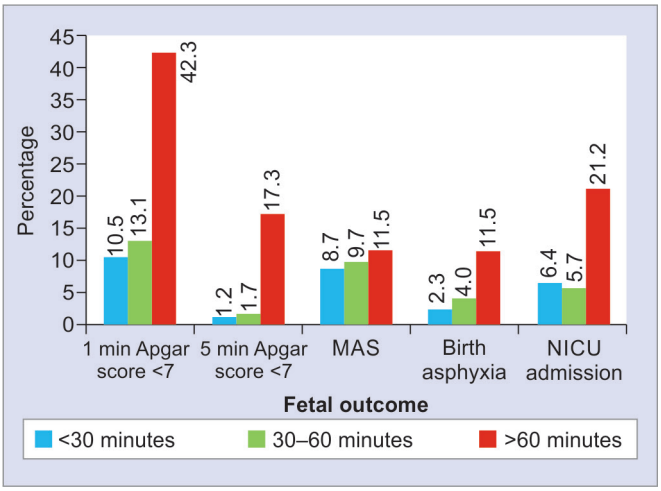

Fig. 1: Effect of second stage duration of labor (minutes) on fetal outcome

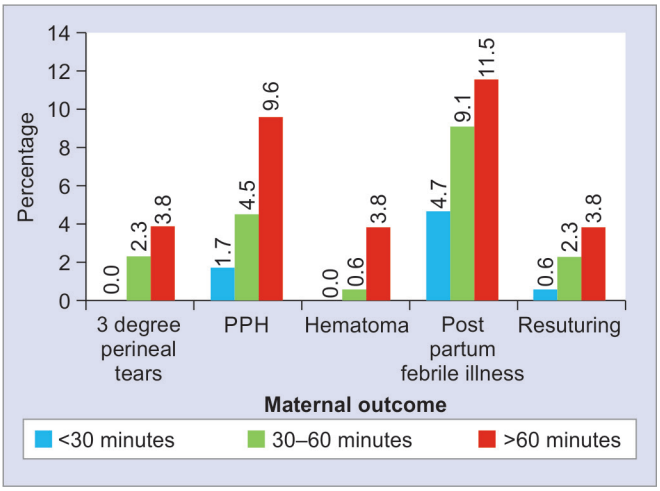

Fig. 2: Effect of SSD of labor (minutes) on maternal outcome

0.0, 2.3, and 3.8; 1.7, 4.5, and 9.6 in postpartum hemorrhage (PPH); 0.0, 0.6, and 4.8 in hematoma; 4.7, 9.1 and 11.5 in postpartum febrile illness; and 0.6, 2.3, and 3.8 in resuturing, respectively, however, was statistically significant only in PPH and hematoma.

Discussion

Recently, in March 2021, the WHO has introduced the WHO next-generation partograph, known as WHO Labor Care Guide.[12] It has created a section for second stage labor monitoring.

Four hundred patients were studied in our study over a period of 18 months. Patients were segregated according to parity and different age sets. Two hundred six patients were primigravida and 194 multigravidas with mean age being 26.8 ± 2.14 years and 30.7 ± 3.74 years, respectively.

Observing the factors influenced by parity in this study, a significant correlation was noted between parity and type of labor (*p*-value < 0.001), SSD (*p*-value = 0.001), initial second stage partograph SSP score (*p*-value = 0.025), second stage partogram progress SSPP (*p*-value of 0.014), and mode of delivery (*p*-value = 0.011).

In our study, the effect of parity and second stage partogram progress SSPP was studied, and a statistically significant correlation between parity and second stage partogram progress (*p*-value of 0.014) was observed. In addition to this observation, the effect of parity on second stage progress was also studied; however, no significant correlation was noted (*p*-value of 0.497).

Comparing the effect of initial SSP score on mode of delivery, a significant correlation was observed in both primigravida and multigravida. In primigravida, a score <3 predicts spontaneous vaginal delivery (SVD) in 61.8%, instrumental vaginal delivery (IVD) in 14.5%, and LSCS in 23.7%, while a score of ≥3 predicts SVD in 90.0% , IVD in 5.4%, and LSCS in 4.6% with a *p*-value of < 0.001. In multigravida with score < 3, 58.2% had SVD, 29.1% IVD, and 12.7% needed LSCS, whereas subjects with score ≥3 98.6% had SVD, 1.4% IVD and none of the patient needed LSCS with *p*-value <0.001. In a study by Kanmani,[13] similar results were obtained.

While studying the effect of initial SSPs on duration of labor a statistically significant observation was found in both primigravida and multigravida with *p*-value of <0.001. In patients with initial score ≥3, it was observed that the duration of second stage was less as compared with patients with SSPs <3 in whom duration of second stage was more (*p*-value of 0.001).

We also observed the effect of initial SSP score on maternal and fetal outcome and a significant correlation was found between SSPs on PPH with *p*-value of 0.040, postpartum febrile illness with *p*-value of 0.012, 1 minute Apgar score <7 with *p*-value of 0.001; other complications such as hematoma, resuturing of episiotomy, meconium aspiration syndrome (MAS), birth asphyxia, and NICU admission were also found higher in patients with SSPs < 3.

Analyzing the effect of second stage partogram progress on mode of delivery, a significant correlation was found with *p*-value of < 0.001. In patients with normal second stage partogram progress, 86.6% patients had SVD and 13.4% had operative delivery which included IVD in 8.4% and LSCS in 5%. In patients with abnormal second stage partogram progress, 70% had SVD and 30% had operative delivery which included LSCS in 18.8% patients and IVD in 11.3%. Similar results were observed by Sizer et al.,[11] in their study, where they concluded that a second stage partogram noted a significant correlation between normal progress of second stage partogram and SVD with *p*-value of < 0.001 in both multigravida and primigravida.

While studying the effect of position on duration of second stage labor irrespective of parity, it was observed to be statistically significant with *p*-value of < 0.001. SSD was <30 minutes in 46.8% patients with OA position, 16.7% patients with OT, and 11.1% patients with OP position. It was between 30 and 60 minutes in 42.8% patients with OA position, 25% patients with OT, and 52.8% patients with OP position. SSD was >60 minutes in 10.4% patients with OA position, 8.3% patients with OT, and 36.1% patients with OP position. The above data depict that the position of fetal head affects the duration of second stage with SSD in the order of OP > OT > OA concluding that the OA position of fetal head is more favorable. Our observations were similar to Senecal et al.[14]

Analyzing the effect of SSD on mode of delivery in study population, a significant correlation was observed with *p*-value of < 0.001, showing that the extension in duration of second stage increases the chances of operative delivery. Our data depict that <30 minutes, there were 99.4% SVD, 0.6% IVD, and none of the patient had LSCS. In patients with SSD 30–60 minutes, 84.7% had SVD, 14.2% IVD, and 1.1% patients had LSCS. Second stage duration >60 minutes increased the rate of LSCS to 55.8%, IVD to 19.2%, and SVD was reduced to 25.0%. Prolongation of SSD increases the rate of operative delivery and decreases the chance of SVD. A study by Cheng et al.[15] supported our observations who in his study concluded that a prolonged second stage is associated with increased operative delivery rates.[16] Similar observations were noted by Kanmani,[13] in his study, where he observed that SSD >1 hour required more interventions irrespective of parity.

While studying the neonatal outcome of 400 neonates in our study, it was observed that 15.8% neonates had 1 minute Apgar <7, of whom 12.3% showed improvement at 5 minutes Apgar score. While observing the fetal and maternal complications, we observed 9.5% neonates had MAS, 4.3% had asphyxia, and 8.0% neonates required NICU admissions, third degree perineal tears in 1.5%, PPH in 4%, hematoma in 0.8%, postpartum febrile illness being present in 7.5% patients and resuturing of episiotomy in 1.8%.

Conclusion

This study was aimed at using second stage partogram to prognosticate obstetric and perinatal outcome by using variables such as station and position of head. To conclude, second stage partogram can helps us to early detect the abnormal progress of second stage and to intervene early in terms of augmentation of labor or operative vaginal delivery and prevent maternal and fetal complications.

Orcid

Shazia Bashir https://orcid.org/0000-0003-3852-0776
Rassieq Aslam https://orcid.org/0000-0002-4055-2403

References

1. Normal Labor, Chapter 22, Williams Obstetrics, 25th edition.
2. Management of second stage of labor. In: Chandraharan E (Ed). The Continuous Textbook of Women's Medicine Series, Labor and Delivery Obstetrics Module, Vol. 11.
3. Cohen W, Friedman EA. Clinical evaluation of labor: An evidence and experience based approach. J Perinat Med 2020. DOI: 10.1515/jpm-2020-0256.
4. Abnormal labor, Chapter 23. In Cunningham F, Leveno KJ, Bloom SL, (Eds.), Williams Obstetrics, McGraw Hill: 2018:25e.
5. Abnormal Labor Patterns, Prolonged Labor, Chapter 21. In: Sharma JB (Ed). Textbook of Obstetrics, 2nd edition.
6. Mathai M. The partograph for the prevention of obstructed labor. Clin Obstet Gynecol 2009;52(2):256–269. DOI: 10.1097/GRF.0b013e3181a4f163.
7. WHO. WHO Recommendations of Augmentation of Labour. WHO 2014. PMID: 25506951.
8. Dalal AR, Purandare AC. The partograph in childbirth: An absolute essentiality or a mere exercise? J Obstet Gynaecol India 2018;68(1):3–14. DOI: 10.1007/s13224-017-1051-y.
9. Kolekar R, Gundalli SM, Kolekar A, et al. Role of partogram in nulliparas. Int J Sci Res 2014;3(12):2539–2544.
10. FIGO Guidelines, Management of second stage of labor. Int J Gynaecol Obstet 2012;119:111–116. DOI: 10.1016/j.ijgo.2012.08.002.
11. Sizer AR, Evans J, Bailey SM, et al. A second stage partogram. Obstet Gynecol 2000;96(5):678–683. DOI: 10.1016/s0029-7844(00)00981-9.
12. Hofmeyr GJ, Bernitz S, Bonet M, et al. WHO next-generation partograph: Revolutionary steps towards individualised labour care. BJOG IJOG 2021;128(10):1658–1662. DOI: 10.1111/1471-0528.16694.
13. Kanmani M. Evaluation of second stage partogram in obstetric outcome. [Master's thesis]. Chennai: Madras Medical College; 2009.
14. Senecal J, Xiong X, Fraser WD. Effect of fetal position on second stage duration and labour outcome. Obstet Gynecol 2005;105(4):763–772. DOI: 10.1097/01.AOG.0000154889.47063.84.
15. Cheng YW, Hopkins LM, Caughey AB. How long is too long: Does a prolonged second stage in nulliparous women affect maternal and neonatal outcomes. Am J Obstet Gynecol 2004;191(3):933–938. DOI: 10.1016/j.ajog.2004.05.044.
16. Ruchika G, Asha N, Rajani R. Study of labour abnormalities with reference to composite partograph. Int J Curr Res Rev 2016;4(2):113–123. ISSN: 2347–3215.