http://jmscr.igmpublication.org/home/
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v9i6.33

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Original Research Article

Role of Registration, Age, Parity, POG and Birth Weight in Fetal Distress and Neonatal Outcome

Author
Dr Amod Kumar Singh
Associate Professor, Department of Obstetrics & Gynaecology, Dr. Y.S.P. Govt. Medical College, Nahan, H.P, India

Abstract
A prospective study was conducted at Kamla Nehru Hospital, I.G.M.C, Shimla on 100 women with one more signs of fetal distress like abnormal fetal movement perception by mother, meconium staining of amniotic fluid and fetal heart rate abnormality. Neonatal outcome was observed in relation to fetal distress at one and five minutes APGAR score. Neonates were found more asphyxiated in extremes of maternal age i.e. <20 years and >30 years, in unbooked cases, in primigravida and gravida>3 and with increasing period of gestation (POG). Neonatal outcome was poor in low birth weight babies.

Introduction

Every fetus has a potential risk of intrapartum hypoxia or birth injury and an optimum outcome can be concluded only at the end of labour. The aim is to detect at the earliest any associated risk factors like extremes of maternal age, post date or post term pregnancy, parity, booking status of the patient and expected neonatal birth weight which may adversely affect the neonatal outcome. Increased incidence of meconium stained amniotic fluid has been found associated with increased POG in different studies (Eden et al 1978[1], Usher et al 1988[2], Steer et al 1989[3] and Katz and Bows 1992[4]).Amniotic fluid volume was reduced in post term pregnancy and fetuses are more prone to hypoxia and more chances of meconium passage in utero (Leveno et al 1984[5]). The fetus of a prolonged pregnancy appears to be more at risk of hypoxia during labour and in post natal period compared with a fetus at term (Bakketig and Bergsjo 1989[6]). The increased incidence of moderate to severe asphyxia in elderly patients is due to placental insufficiency which is a universally accepted fact. Cunningham and Leveno 1995[7] studied 900 women over 35years of age and concluded a significant increase in still birth and perinatal mortality in this age group. Early registration and regular antenatal checkup always detects fetuses and mother at risk at the earliest; minimising the intrapartum asphyxia and neonatal morbidity and mortality. Russ et al 1946[8] concluded from his studies that in general primi para produces more asphyxiated babies than multi para. However the multi para (gravida ≥3) seems to have a greater tendency to be asphyxiated. Heavier fetus has reserve to withstand labour without alteration of fetal heart rate. Ciblis 1971[9] concluded from his study that APGAR score was significantly better among heavier infants. The small fetuses had poor neonatal outcome.

Material and Methods

A prospective randomized study was conducted in the department of Obstetrics and Gynaecology at Kamla Nehru Hospital I.G.M.C, Shimla between July2202-June2003.Out of total delivery of 3912 during this period 100 patients of full term pregnancy in labour showing one or more clinical signs of fetal distress were selected for the study. Neonatal outcome was predicted on the basis of APGAR score at one and five minutes.

Selection of the Cases

Patients with full term (37-42weeks) normal pregnancy with cephalic presentation in labour who had shown some alteration in fetal heart rate or rhythm, decrease or loss of fetal movements and meconium staining of amniotic liquor on spontaneous or artificial rupture of membrane were selected for the study. Pregnancy with antenatal complications like pregnancy induced hypertension, twin pregnancy, diabetes mellitus, severe anaemia, Rh incompatibility, ante partum haemorrhage and post maturity were excluded from the study. In all cases following observations were made and recorded in the case proforma. In each case a detailed obstetric and menstrual history was taken. Patients were asked about duration of labour pain, history of any bleeding or leakage per vaginum and color of liquor and any decrease or loss of fetal movements. A detailed general, physical, systemic and obstetrical examination was done and findings were noted. Labour was monitored partographically. Out of 100 patients,32 patients were monitored by cardiotocograph. Hb%, blood grouping and Rh typing and urine for albumin and sugar were done in each patient. Duration of first and second stage of labour recorded in cases on Normal Vaginal Delivery (NVD), low forcep delivery and in ventouse application. If delivery was not eminent and clinical monitoring showed ominous signs of fetal distress, patients were taken up for caesarean section. Umblical cord was examined for its length, presence of knots and nicks, number of coils of cord encircling the neck and for number of umblical vessels. Placenta was weighed and examined grossly for size, presence of infarcts, calcifications or any retroplacental clot. Neonates were examined for APGAR score at one and five minutes, birth weight, gestational age, any congenital malformation and meconium staining of cord, nails, skin and cornea and any evidence of meconium aspiration syndrome. Accordings to APGAR score (Apgar V. 1953[10]) at one and five minutes neonates were classified into 3 categories:- 1. APGAR score: 7-10; healthy, no asphyxia. 2. APGAR score: 4-6; mild asphyxia. 3.APGAR score: 0-3; severe asphyxia and still birth. Asphyxiated babies were admitted to neonatal intensive care unit after primary resuscitative measures and followed up as long as the neonate was in hospital.

Statistics: Observations were recorded and analysed using Paired Students t-test.

Observations

Table 1 Relationship of Registration to Neonatal Outcome

Registration	Total Cases	At one minute Apgar Group			At five minute Apgar Group		
		Group I	Group II	Group III	Group I	Group II	Group III
Booked	46	21(45.65%)	20(43.47%)	5(10.86%)	41(81.13%)	5(10.86%)	0
Unbooked	54	9(16.66%)	37(68.5%)	8(14.81%)	42(77.77%)	10(18.51%)	2(3.70%)

Paired student's t-test:

Group I	:t =-1.84,	p=0.207,
Group II	:t=1.94,	p=0.192,
Group III	:t= 1.98,	p=0.187

In Table 1, 83.32% (45 patients) of unbooked patients had asphyxiated babies while only 54.33% (25 patients) of booked patients babies were asphyxiated at one minute APGAR.22.21%

(12 patients) of unbooked patients and 10.86%(5 patients) of booked patients had asphyxiated babies at five minutes APGAR. It was observed from the study that percentage of asphyxiated babies at 1 and 5 minutes APGAR score were more in unbooked cases.

Table 2 Age Distribution and Relation to Neonatal Outcome

Age (Yrs.)	Total	At one minute Apgar Group			At five minutes Apgar Group		
		Group I	Group II	Group III	Group I	Group II	Group III
15-20	8	2(25%)	5(62.5%)	1(12.5%)	3(37.5%)	4(50%)	1(12.5%)
21-25	51	18(35.29%)	24(47.05%)	9(17.64%)	41(80.39%)	9(17.64%)	1(1.96%)
26-30	30	9(29.99%)	18(59.99%)	3(9.99%)	29(96.66%)	1(3.33%)	0
>30	11	3(27.27%)	8(72.72%)	0	10(90.90%)	1(9.09%)	0

Paired student's t-test:

Group I :t= -2.44, p=0.093,
Group II :t= 2.71, p=0.073,
Group III :t= 1.46, p=0.241.

In Table2, at one minute APGAR score 72.72% (8 patients) with >30 years of age, 69.98% (21 patients) between 26-30 years, 64.69%(33 patients) between 21-25years and 75% (6 patients) between 15-20years had asphyxiated babies. At 5 minute APGAR score, 62.5% (5patients) between 15-20years,19.6%(10 patients) between 21-25years and 9.09% (1 patient) >30 years of age group had asphyxiated babies. It was observed that in extremes of age i.e.<20 years and >30years , incidence of asphyxiated babies were high. The best obstetric outcome was noted in age group 21-25years at 1minute and between 26-30years at 5minutes.

Table 3 Parity Distribution and Relation to Neonatal Outcome

Parity	Total Cases	At one minute Apgar Group			At five minute Apgar Group		
		Group I	Group II	Group III	Group I	Group II	Group III
Primigravida	56	19(33.92%)	27(48.21%)	10(17.85%)	43(76.18%)	11(19.64%)	2(3.57%)
Gravida-2	27	10(37.03%)	14(51.85%)	3(11.11%)	23(85.18%)	4(14.18%)	0
Gravida-3	12	4(33.33%)	7(58.33%)	1(8.33%)	12(100%)	0	0
Gravida≥4	5	0	5(100%)	0	5(100%)	0	0

Paired student's t-test:

Group I : t=-3.00, p=0.058,
Group II: t=3.96, p=0.029 (SIGNIFICANT)
Group III : t=1.69, p=0.190.

Table 3 depicts; at 1 minute APGAR 100% (5 patients) babies were asphyxiated in gravida ≥ 4 while 66.06% (37 patients) in primigravida, 62.96% (17patients) in second gravida and 66.66% (8patients) in third gravida had asphyxiated babies. At 5 minutes APGAR score; 100% in gravida ≥4 (5patients) and third gravid (12 patients) had healthy babies. Only 23.21% (13 patients) in primigravida and 14.18% (4 patients) of second gravida had asphyxiated babies. Hence it was observed that primigravida patients were more vulnerable to have asphyxiated babies both at 1 and 5 minutes in comparison to gravida 3 or more. It was statistically significant (p=0.029) in Group II.

Table 4 Distribution of Period of gestation and Neonatal Outcome

POG	Total Cases	At one minute Apgar Group			At five minute Apgar Group		
		Group I	Group II	Group III	Group I	Group II	Group III
37wks. 39 wks.	52	16(30.76%)	29(55.76%)	7(13.46%)	45(86.53%)	6(11.53%)	1(1.92%)
39wks-40wks.	25	7(28%)	14(56%)	4(16%)	20(80%)	4(16%)	1(4%)
40wks.-42wks.	23	8(34.78%)	13(56.52%)	2(8.69%)	18(78.26%)	5(21.73%)	0

Paired student's t-test:

Group I : t=- -2.94, p= 0.099
Group II : t= 2.91, p=0.101
Group III:t= 3.05 , p=0.093

Table 4 shows that at 1minute APGAR 55.76% (29 patients) at POG 37-39weeks, 56% (14patients) at POG 39-40 weeks and 56.52% (13 patients) at POG 40-42weeks had mild to moderately asphyxiated babies. 13.46% (7 patients) at 37-39 weeks, 16% (4 patients) between 39-40weeks and 8.69% (2 patients) between 40-42 weeks had severly asphyxiated babies. At 5minutes 13.45% (7 patients) between 37-39weeks, 20% (5 patients) between 39-40weeks and 21.73% (5 patients) between 40-42weeks had mild to severly asphyxiated babies. It was observed that patients reported between 37-39 weeks has less number of asphyxiated babies as compare to 40-42 weeks gestation.

Table 5 Neonatal Birth Weight-Distribution and Relation to Neonatal Outcome

Birth weight	Total= 100	At one minute			At five minute		
		Group I	Group II	Group III	Group I	Group II	Group III
Upto 2 Kg.	5	2(40%)	3(60%)	0	4(80%)	1(20%)	0
2.1 Kg to 2.5 Kg.	27	6(22.22%)	16(59.26%)	5(18.51%)	22(81.48%)	4(14.81%)	1(3.70%)
2.6Kg to 3 Kg	34	8(23.53%)	22(64.71%)	4(11.76%)	30(88.24%)	3(8.82%)	1(2.94%)
>3 Kg.	34	14(41.18%)	16(47.05%)	4(11.76%)	27(79.41%)	7(20.59%)	0

Paired student's t-test:

Group I : t = -3.16, p=0.05 (SIGNIFICANT)
Group II: t=2.98, p=0.059
Group III: t= 2.91, p=0.062

Table 5 shows, in upto 2 kg weight 60% (3babies) at 1minute and 20% (1baby) at 5 minutes were mild to moderately asphyxiated. In 2.1-2.5kg weight 77.77% (21 babies) at 1minute and 18.5% (5 babies) at 5 minutes were moderately to severly asphyxiated. In 2.62-3kg weight 23.53% (8babies) at 1minute and 88.24% (30 babies) at 5minutes has APGAR score ≥7.In >3Kg weight 58.81% (20 babies) at 1minute and 20.59% (7 babies) at 5minutes were asphyxiated. It was noticed that neonatal outcome was best in babies with birth weight between 2.6-3Kg groups. Neonatal outcome was poor in low birth weight babies. It was statistically significant (p=0.05).

Discussion

- **Correlation of Registration with Neonatal Outcome:**

As depicted in Table1, the number of asphyxiated babies were more in unbooked cases than booked one. This finding is consistent with the findings of Narula S (1992[11]).

- **Age Distribution and Relation to Neonatal Outcome:**

As observed in Table 2, in extremes of age (15-20years and >30years) incidence of asphyxiated babies were high. These findings are consistent with the findings of Prasun et al (1986[12]). Advancing maternal age had increased percentage of asphyxiated babies at 1minute APGAR. These observations were consistent with the observations of Russ J.D. (1946[8]) and Cunningham and Leveno

(1995[7]) in which they concluded that mothers with >35years of age are at increased risk of poor neonatal outcome.

- **Parity Distribution and Relation to Neonatal Outcome:**

As depicted in table 3, parity had shown a definite and a significant impact on neonatal outcome (p=0.029 in Group II).In primigravida 66.06% (37patients) at 1minute and 23.21% (13patients) at 5 minutes had babies with moderate to severe birth asphyxia. 66.66% (8 patients) of gravida 3 and 100% (5patients) of gravida ≥4 had moderate to severly asphyxiated babies at 1minute. Above findings are consistent with the findings of Pradip et al (1995[13]), Russ J.D et al (1946[8]) in which they concluded that primi para produce more asphyxiated babies than do multi para. However the babies of multipara (gravida ≥3) seems to have a greater tendency to be asphyxiated.

- **Distribution of POG and Neonatal Outcome:**

The presence of meconium is correlated best with gestational age as stated by Steer et al (1989[3]). In the present study out of 100patients, 78% (78 patients) had meconium stained amniotic liquor alone or with fetal heart rate abnormality. The percentage of meconium passage has increased considerably after 40 weeks of gestation in studies of Eden et al (1978[1]), Usher et al (1988[2]), Steer et al (1989[3]) , Katz and Bows (1992[4]) , Leveno et al (1984[5]), and Bakketig and Bergsjo (1989[6]). The best neonatal outcome was observed between 37-39weeks and worst between 40-42 weeks of gestation.

- **Neonatal Birth Weight-Distribution and Neonatal Outcome:**

As depicted in Table 5, the best neonatal outcome was among birth weight of 2.6-3Kg group and neonatal outcome was poor in low birth weight babies. Among Group II of table 5, the relation of babies according to birth weight had nearly a significant value (p=0.059) at 1and 5minutes APGAR score. There was a statistically significant relation (p=0.05) among group I at 1 and 5minutes APGAR score. So this study had denoted a betterment of APGAR score as birth weight increased consistent with the findings of Prasun et al (1986[12]) and Ciblis (1971[9]).

Conclusion

It can be concluded from the study that neonates were found more asphyxiated in extremes of maternal age (<20years and >30years), in unbooked cases, in primigravida and gravida>3, with increasing POG and in low birth weight babies (<2.5Kg). So these parameters can also be looked after keenly to predict a good or bad neonatal outcome apart from labour accidents.

Bibliography

1. Eden RD, Seifert LS, Winegar A, Spellacy W.: Perinatal characteristics of uncomplicated post date pregnancies. Obstet. Gynaecol 1987;69:296.
2. Usher RH, Boyd ME, Mclean FH, Kramer MS: Assessment of fetal risk in post date pregnancies. Am J. Obstet. Gynaecol. 1988;158:259.
3. P.J. Steer, F. Eigbe, T.J. Liussauer and R.W. Beard: Obstet. Gynaecol 1989;74: 715-21.
4. Katz VL, Bowes WA: Meconium aspirations, Reflections on a murky subject. Am. J. Obstet. Gynaecol. 1992; 166:171.
5. Leveno KJ, Quirck JG, Cunningham FG, Nelson SD, Santosh RR, Toofanian A, DePalma RT: Prolonged pregnancy observation concerning cause of fetal distress. Am. J. Obstet. Gynaecol. 1984; 150:465-73.
6. Bakketeig L, Bergsjo P: Post-term pregnancy magnitude of the problem. In Chalmerl, Enkin M. Keirse MJNC, eds.: Effective care in pregnancy and child birth, Vol. I. Oxford: Oxford University Press,1989;pp.765-775.

7. Cunningham F.G, Leveno K.J.: Child bearing among older women. The message is continuously optimistic (editorial comment). N Engl. J Med.1995;333:1002.
8. Russ JD. Strong A.R: Asphyxia of the new born infant 1946;5:643-651.
9. Ciblis L.A.: Clinical significance of fetal heart rate patterns during labour II.Late decelerations. Am. J. Obstet. and Gynaecol;1971;127:473-494.
10. Apgar V. A proposal for a new method of evaluation of the newborn infant. Curr. Res. Anesth Analg 1953:32:260.
11. Narula S.: Study of fetal distress-Determinants and outcome,68:1992.
12. Prasun Kumar Pal and Jagbandhu Mitra: Clinical study on fetal hypoxia in relation to caesarean section. Journal of Obstet. And Gynaecol. India 1986;Vol-XXXVI No.5:822-826.
13. Pradip Sambarey and Vaishali Shinde: Diagnosis and management of fetal distress in labor. Journal Obstet and Gynaecol of India;1995;Vol.45,No.6:702-707.