



Descriptive Study of Obstetric Brachial Plexus Palsy (OBPP) at a Tertiary Care Hospital

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Abstract

Objective To study the incidence and risk factors for obstetric brachial plexus palsy and assess the functional outcome.

Material and Methods Five-year data of infants with OBPP were reviewed. Case–control study was performed using matched controls to identify the risk factors. Infants with OBPP were followed up to assess functional outcome.

Results Of the 14,184 live births over a period of 5 years from 2013 to 2017, 23 (11 males, 12 females) had OBPP. Incidence of OBPP was 1.6 per 1000 live births. Higher birth weight (p -value 0.002) and instrumental delivery (p -value 0.02) were independent risk factors for obstetric brachial plexus palsy by multivariate logistic regression analysis. No cases of obstetric brachial plexus palsy were seen in babies born by cesarean section. 95% of the infants with obstetric brachial plexus palsy had complete recovery by 4 months of age.

Conclusion Higher birth weight and instrumental vaginal delivery are independent risk factors for obstetric brachial plexus palsy. Cesarean section may have a protective effect against OBPP. Most infants with obstetric brachial plexus palsy have complete recovery.

Keywords Obstetric brachial plexus palsy · Instrumental delivery · Birth weight · Residual deficit

Introduction

Obstetric brachial plexus palsy (OBPP) is a common birth injury, with a reported incidence of 0.38–5.1 per 1000 live births in various countries [1]. Although several known risk factors exist like shoulder dystocia and instrumental deliveries, more than 50% of infants with OBPP have no known risk factors [2].

Eighty to ninety-five percent of infants with obstetric brachial plexus palsy will recover spontaneously within the first

2 months of life [2]. The children who do not spontaneously recover by 2 months of age will likely have permanent loss.

Aims and Objective

To study the incidence and risk factors for obstetric brachial plexus palsy and assess the functional outcome.

Materials and Methods

This retrospective study was performed in the Department of Neonatology at MOSC Medical College Hospital, Kolenchery, Kerala, India. All the case files of infants with obstetric brachial plexus palsy (OBPP) in the 5-year period from January 2013 to December 2017 were reviewed. Demographic details, maternal and birth history, postnatal course and subsequent follow-up data of neurological findings (recovery/residual impairment) were obtained.

Case–control study was done to identify the risk factors for OBPP. Risk factors were analyzed using matched

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controls. Controls were selected as 2 infants of gestation ≥ 37 weeks born prior to each index case.

Statistical analysis: Statistical analysis was performed by using univariate and multivariate logistic regression model using R software EZR 1.35 version.

Results

Of the 14,184 live births in the 5-year period from 2013 to 2017, 23 (11 males and 12 females) had OBPP. Incidence of OBPP was 1.6 per 1000 live births.

Of the 23 cases of infants with OBPP, 14 infants weighed > 3.5 kg at birth, whereas in the control group, 6 out of 46 infants weighed more than 3.5 kg at birth. Nine out of twenty-three infants with OBPP were born by instrumental vaginal delivery and 14 were born by vaginal delivery without instrumentation. In the control group of 46 infants, only 1 was born by instrumental vaginal delivery, 22 by normal vaginal delivery and 23 by cesarean section. Higher birth weight (p -value 0.002) and instrumental delivery (p -value 0.02) were independent risk factors for obstetric brachial

plexus palsy by multivariate logistic regression analysis. No cases of obstetric brachial plexus palsy were seen in babies born by cesarean section. (Table 1) Two infants were lost to follow-up. Twenty-one infants were followed up till 1 year of age. Twenty infants had complete recovery by 4 months age. Only 1 infant had residual deficit at the age of 1 year. (Table 2).

Discussion

Incidence of OBPP has been reported to be 0.38–5.1 per 1,000 live births in various countries. [1] In western Sweden, the incidence was reported to be 2.9 per 1000 live births. [4] In a large 15-year study done in USA, incidence of brachial plexus palsy was seen to be steadily decreasing from 1.7/1000 live births in 1997 to 0.9/1000 live births in 2012. [2] In our study, incidence of OBPP was 1.6 per 1000 live births.

Shoulder dystocia was the most important risk factor for obstetric brachial palsy, while other risk factors were instrumental delivery, large baby, and maternal diabetes. [2,

Table 1 Risk factors for Obstetric Brachial Plexus Palsy

Variable	Controls (n=46)	Cases (n=23)	Univariate Analysis		Multivariate Analysis		
			Odds ratio	P—Value	Odds ratio	P – Value	
Maternal age (years)	<35	40	21	0.63	0.59	–	–
	≥ 35	6	2				
Parity	Multipara	20	6	2.17	0.16	–	–
	Primigravida	26	17				
Mode of delivery	Forceps assisted vaginal delivery	1	9	1	0.05*	1	0.08
	Spontaneous vaginal delivery	22	14	0.07	0.01*	0.06	0.02*
	LSCS	23	0	0.00	0.99	0.00	0.99
Birth weight	<3.5 kg	40	9	10.37	<0.001*	12.98	0.002*
	≥ 3.5 kg	6	14				
Gestational age	<40 weeks	41	15	4.37	0.02*	2.76	0.29
	≥ 40 weeks	5	8				
Sex	Male	24	12	1.00	1.00	–	–
	Female	22	11				
Maternal diabetes	No	41	21	0.78	0.77	–	–
	Yes	5	2				
Shoulder dystocia	No	46	10	7.43 e10	0.99	–	–
	Yes	0	13				

Table 2 Follow-up of infants with Obstetric Brachial Plexus Palsy

Total live births in 5 years	Total cases of OBPP	Lost to follow up	Complete recovery before 4 months age	Complete recovery before 1 year age	Residual deficit	Incidence of OBPP per 1000 live births	Persisting OBPP after 1 year age / 1000 live births
14,184	23	2	19 (95%)	1	1	1.6	0.07

3] Despite the fact that a number of risk factors have been associated with OBPP, the neonates who will demonstrate OBPP cannot be predicted. [3] Cesarean delivery was protective against OBPP and probably contributed to decreased incidence over last 15 years. [2] In our study, we found that shoulder dystocia, higher birth weight, post-dated gestation and instrumental vaginal deliveries had significant association with OBPP; however, higher birth weight and forceps-assisted vaginal deliveries were independent predictors of OBPP.

In the Swedish study, the prevalence of persisting OBPP at 18 months was 0.46 per 1000. [4] Most children with an OBPP recover completely, but one in five has symptoms of the injury at 10–12 years of age. It has been suggested that active elbow flexion, shoulder external rotation and forearm supination at three months can be used to predict outcome. [4, 5] In our study, it was found that 95% infants with OBPP had complete recovery. Incidence of persisting OBPP at 1 year of age was 0.07 per 1000 live births. With the almost vigilant approach prevailing in the health supervisors of our country to prevent cesarean sections, it is likely that the number of cases of obstetric brachial plexus palsy could increase.

Conclusion

Larger infants born by vaginal delivery especially with assisted instrumentation may be at a higher risk for obstetric brachial plexus palsy, and this may be prevented by considering cesarean section. Most infants with obstetric brachial plexus palsy have complete recovery, but for those with permanent residual deficit quality of life is affected.

Limitation Multicenter studies involving larger number of cases of obstetric brachial plexus palsy are required to make definitive conclusions and recommendations.

Author Contributions KD conceived the idea of research paper. KD and LK helped with the study design. SK was involved in data collection and performed data analysis. KD and LK critically reviewed the manuscript.

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Declaration

Conflicts of interest The authors declare that there is no conflict of interest.

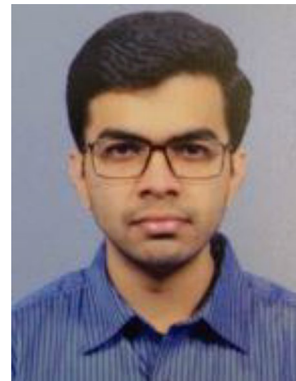
Human Animals Rights None. (Data were retrospectively reviewed).

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