

Prevalence of hyaline membrane disease in cesarean section in al-kadhamia teaching hospital

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Abstract

Background: Hyaline membrane disease ,one of the commonest cause of sever respiratory distress early in life ,which is caused by surfactant deficiency is described not only in preterm infant but also in near term babies after cesarean section .

Objective: The study aimed to identify the occurrence of hyaline membrane disease following cesarean section (cs) in AL-Kadhimiya Teaching Hospital.

Patient and methods: The study was conducted during the period between 1st January-30 April 2009, on 372 neonate born in AL-Kadhimiya Teaching Hospital .All patients were singletons, their gestational age between 37-40 weeks, and their body weight >2.5 kg. They were grouped into 3 groups according to the mode of delivery, normal vaginal delivery (NVD), emergency or elective CS.

Result: Males were affected more than females (14.1%&9.2% respectively), occurrence of hyaline membrane disease was much higher after

delivery by CS(18.5%)., than after NVD (4.76 %).There was little difference in the occurrence of hyaline membrane disease between emergency and elective CS and the lower the body weight of the neonate the more the occurrence of hyaline membrane disease was noted.

Conclusion: Normal vaginal delivery has a possible protective effect against hyaline membrane disease as the frequencies of it's occurrence was noticed to be less in normal vaginal deliveries than in cesarean section deliveries.

Key words: Hyaline membrane disease, normal vaginal delivery, cesarean section ,elective ,emergency .

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Introduction

Hyaline membrane disease (HMD) which is characterized by stiff , non – compliant lungs and is due to surfactant deficiency ,is one of the commonest cause of Respiratory distress syndrome(RDS) that occur early in life ⁽¹⁾,This syndrome defined as the presence of at least two of

the following clinical sings: tachypnea >60 , dyspnea with inspiratory sub costal and intercostals retractions, nasal flaring, expiratory grunting and cyanosis in room air . the most frequent underlying cause of RDS during the first 48 hours are transient tachypnea of the new born , infections, meconium aspiration syndrome , hyaline membrane disease (HMD) and perinatal asphyxia ⁽²⁾.The diagnosis of HMD will depend on clinical feature in addition to chest radiography which shows diffuse reticulogranular opacities , air

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branchograms and small lung volume the main factors predisposing to HMD include prematurity, male sex, and maternal diabetes⁽³⁾ also cesarean section in particular is associated with increase incidence of hyaline membrane disease⁽⁴⁾, and delivery by cesarean section continue to increase in both developed and developing countries⁽⁵⁾.

Patient and method

A cross-sectional study was done in Al-Kadhimiya Teaching hospital at the period from 1st of January-30 April 2009. A three hundred seventy two neonate were included in the study 189(50.8%), delivered by normal vaginal delivery and 183(49.2%) delivered by cesarean section (160 of them delivered by emergency cesarean section and 23 by elective cesarean section), all of them were singletons, their gestational age from 37-40 weeks and without apparent congenital malformations, all pregnancies associated with pre-eclampsia, chronic hypertension, diabetes, multiple gestations and meconium stained amniotic fluid were excluded.

We recognized cesarean sections done after the start of labor or rupture of membrane as emergency cesarean section, while those done before the

onset of labor or by scheduled surgery were considered as elective cesarean section. Vaginal delivery was considered normal if the onset of labor was spontaneous and there was no complication of pregnancy or instrumentations.

Then all neonates were grouped into three groups according to their body weight, the first group weight was 2.5-3, kg, the second group weight was 3.1-3.5 kg, the third group weight > 3.5 kg, then we compare the incidence of HMD in each group. All result were expressed in numbers and percentages while statistical analysis was done by using chi square and p value of equal or less than 0.05 was designated as statistically significant.

Results

In our study total number of neonate was 372, 189(50.81%) of them delivered by NVD and 183(49.19 %) delivered by CS and the percentage of emergency CS was 160 (87.43 %), and the elective CS was 23 (12.43 %) of total CS, also it had been found that 9 (4.76 %) Of neonate delivered by NVD had HMD in contrast to 17.3 % (34) of those delivered by CS, which is statistical significant since p value was 0.00017 .this is shown in table 1.

Table 1: Distribution of HMD and mode of delivery.

Type of delivery	Em.CS	%	El.CS	%	NVD	%	total	%
HMD								
HMD +ve	30	18.7%	4	17.3%	9	4.76%	43	11.5%
HMD -ve	130	81.3%	19	82.6%	180	95.2%	329	88.4%
Total	160	100%	23	100%	189	100%	372	100%

$\chi^2=17.4$
 $df=2$
 $P=0.00017$

Em.CS :Emergency cesarean section

El.CS :Elective cesarean section

Table 2 . Shows that 34.85 % of those neonate whose body weight (B. wt) was bellow 3 Kg and the percentage decrease with increasing in B. wt until

it reach 4.73 % of neonate with B.wt more than 3.5 Kg which statistically significant result , p value equal to 0.00000012.

Table 2: Distribution HMD according to body weight.

B.wt	2.5-3 kg		3.1-3.5kg		>3.5kg		total
	No	%	No	%	No	%	
HMD							
HMD+ve	23	34.85%	13	8.23 %	7	4.73 %	43
HMD-ve	43	65.15%	145	91.77%	141	95.27%	329
total	66	100 %	158	100 %	148	100 %	372

$\chi^2=35.03$
 $df=3$
 $P=0.00000012$

B.wt :body weight

In this study it had been found that male were slightly affected more than female

(14.1% and 9.2% respectively) as shown in table 3.

Table 3: Distribution of HMD according to sex.

	Male		females		Total
	No.	%	No	%	
HMD+ve	25	14.2	18	9.3	43
HMD-ve	152	85.8	177	90.7	329
Total	177	100	195	100	372

Discussion

In this study the occurrence of HMD in term babies was high (11.5%) in comparison with other studies like a study in England⁽⁶⁾ where the incidence is 0.1%.

Delivery by CS showed increased risk of HMD in both emergency and elective CS, but the risk is low in neonate delivered by NVD. These results are similar to many other studies which had demonstrated the protective nature of NVD in lowering the incidence of HMD. In Norwegian population –based cohort study they found cesarean delivery to be a major risk factor associated with the development of HMD⁽⁷⁾. A hospital based case control study in Beirut showed that after controlling for other factors HMD was twice as likely in infants delivered by cesarean delivery⁽⁸⁾. Another study done in Pakistan showed that HMD is three folds higher in CS group than those delivered vaginally⁽⁹⁾. Some authors have suggested that the mechanism for decreased HMD in vaginally delivered neonates is associated with endogenous prostaglandin production stimulated by uterine activity^(10,11). Some have suggested labor results in the release of lung surfactant into the airways, other theories to explain HMD in cesarean delivered infants include persistent fetal circulation as well as increased retention of pulmonary fluid in neonate delivered by CS.⁽¹²⁾ During vaginal delivery about one third of fetal lung fluid is removed by squeezing the babies chest, this removal is missing during delivery by

CS⁽¹³⁾. Others have suggested that a beta-adrenergic surge during labor may be responsible for the ultimate fetal lung expulsion of surfactant in preparation for birth⁽¹⁴⁻¹⁶⁾.

In this study HMD was nearly the same in those delivered by emergency CS and in those delivered by elective CS, while in other studies like Curet et al , and Kim A found cesarean delivery before labor associated with higher incidence of HMD compared with cesarean done after the onset of labor pain⁽¹⁷⁻¹⁹⁾. This can be explained by the fact that the time of delivery that matters because that is what determines lung functional development – a view borne out by Gabert et al⁽²⁰⁾ who showed that CS was not associated with HMD when the lecithin –sphingomyelin ratio offered a good prognosis. In this study HMD was inversely proportional to body weight of neonate , similar results were obtained by many other studies like in Australian study showing that higher risk of HMD was associated with body weights lower than 2.5kg and the risk is lower in those Weighing > 3.5 kg⁽⁹⁾.

This was explained by the fact that HMD is thought to be caused by high lung alveolar surface tension, causing atelectasis and lack of pulmonary surfactant, which is a combination of lecithin ,phosphatidylglycerol , cholesterol and surfactant apoproteins. The production of surfactant by fetal lung begins by week 20 but does not reach the surface of the fetal lung until much later⁽¹⁵⁾. In this study males are

affected more than females and this is similar to all the above studies.

All doctors should always remember that NVD has a protective effect against hyaline membrane disease, so CS should be limited only to those patients with real indications, and elective CS should always be planned at 39-40 weeks of gestation.

Also patients should be educated about the risk of CS on the baby.

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