

Effect of maternal age on fetal outcome

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Abstract

Introduction: Low birth weight is one of the most serious challenges in maternal and child health care in both developing and developed countries. **Aim of the study:** Our aim was to study the correlation between maternal age and fetal outcome measured in terms of fetal weight and perinatal mortality. **Materials and Methods:** This was a hospital based prospective study conducted in the department of obstetrics and gynecology in our teaching medical college and hospital over a period of 2 years extending from Jan 2011 - Dec 2012. All the cases delivering in this hospital were taken for this study. Total of about 1449 cases were taken for this study. **Results:** The average age of patients in this study was 23.92 ±4.09. It was observed that there was an increase in birth weight with increasing age up to 40 years. The difference in birth weight between patients less than 20 years of age and in those between 20-29 years of age was found to be statistically significant ($p < 0.01$) while no statistical significance was found in birth weight between the age group 20-29 and 30-39 years ($p > 0.05$). There was an increase in perinatal mortality with increasing age with the least being in those patients less than 20 years of age. The difference in perinatal mortality between the different age groups was found to be statistically insignificant ($p > 0.05$) **Conclusion:** Increasing maternal age was associated with increase in birth weight. There was no statistically significant association of maternal age with perinatal mortality rate.

Key words: Maternal Age, Birth Weight, Perinatal Mortality

Introduction

Our country being vast and divided into so many regions with different cultural, ethnic and nutritional background the limits of normal parameters like optimum fetal birth weight, acceptable perinatal mortality and morbidity in relation to maternal age has not been standardized. Because of the regional variations and also because of the fact that we are not able to set standard parameters we aim to undertake this study. Low birth weight is one of the most serious challenges in maternal and child health care in both developing and developed countries. Low birth weight is the main contributing factor in perinatal mortality and morbidity [1,2] and LBW newborns are at higher risk for perinatal and infant mortality [3,4,5]. Birth weight is a good gauge of health of the child in the womb because the weight is taken immediately after birth.

The impact that the decision to delay childbearing has on maternal and perinatal outcomes becomes very relevant

nowadays as more women postpone childbearing until they are over the age of 35. There are numerous reports in the literature assessing the effect of advanced maternal age on pregnancy outcomes but results are varied [6,7]. One of the most striking changes in the demography of developed countries during the last 20 years has been the postponement of childbirth until women are in their late 30's [8]. In the Indian scenario, the NFHS 3 reports association of low birth weight with age of mother [9].

The present study is aimed to study the correlation between maternal age with fetal outcome measured in terms of fetal weight and perinatal mortality

Materials and Methods

The work was started after obtaining ethical committee clearance. Informed consent was obtained from each patient before taking part in the study. This was a hospital based prospective study conducted in the department of obstetrics and gynecology in our teaching medical college and hospital over a period of 2 years extending from Jan 2011 - Dec 2012. All the cases delivering in this hospital

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were taken for this study. Total of about 1449 cases were taken for this study. The patients were from both rural and urban areas. A detailed history including past and present history was taken from each patient and a thorough physical examination was done and basic investigations were done for all patients. Data was collected on a structured, predesigned and pretested questionnaire. The emphasis was on maternal age at the start of pregnancy .

The period of gestation was calculated from the first day of the last menstrual period, using the simple Naegle's rule and it was recorded in completed weeks Confirmation of gestational age was done in all babies

Result

Table 1-Relationship of maternal age with mean birth weight and PNMR

Age group	Number	Percentage	Mean birth weight	P value	PNMR*	P value
<20	145	10.01	2.481± 0.568	P< 0.01	2.07%	P>0.05
20-29	1144	78.95	2.618± 0.562		3.50%	
30-39	159	10.97	2.629±0.636	P>0.05	5.66%	
>40	1	0.07				

*Perinatal mortality rate

Table-1 shows the relationship of maternal age with mean birth weight and perinatal mortality rate. The average age of patients in this study was 23.92 ± 4.09 in years. The single largest group of mothers was in the age group of 20-29 years. Of the 1449 patients included in this study, 10.01 % were less than 20 years of age, 78.95% were between 20-29 yrs of age, 10.97% were between 30-39 years and 0.07% was found to be more than 40 years. The mean birth weight was found to be 2.481 ± 0.568 in kilograms in patients less than 20 years and it was 2.618 ± 0.562 kilograms and 2.629 ± 0.636 kilograms in the age group 20-29 years and 30-39 years respectively. It was observed that there was an increase in birth weight with increasing age up to 40 years. The difference in birth weight between patients less than 20 years of age and in those between 20-29 years of age was found to be statistically significant ($p<0.01$) while no statistical significance was found in birth weight between the age group 20-29 years and 30-39 years ($p>0.05$).

It was found there was an increase in perinatal mortality with increasing age with the least being in those patients less than 20 years of age. The perinatal mortality in the age group of less than 20 years was 2.07% while in the age group of 20-29 years it was found to be 3.5 % and in the age group 30-39 years it was 5.66%. In spite of this, the difference in perinatal mortality between the different age groups was found to be statistically insignificant ($p>0.05$).

Discussion

Various maternal factors have varying degrees of influence on the ultimate outcome of the fetus in relation to its birth weight. The degree of influence each maternal factor has on intrauterine growth however varies. The mean birth weight in this study was 2.61 ± 0.58 kg. As mentioned earlier these weights were obtained within an hour of delivery and hence the postnatal loss of weight did not account for any decrease in weight. The single largest groups of mothers were in the age group of 20-29 years which correspond to the average reproductive profile of the country. Mothers in the age group less than 20 years had the lowest birth weight. The mean birth

weight was found to increase upto the age of 40 years. This was also demonstrated by Pachauri et al [11], and Ghosh et al [12]. They found a decline in birth weight after the age of 40 years. This could not be demonstrated in our study as there was only one patient in the age group more than 40 years. This study corroborates with that of Bhargava et al [13], Khatua [14] and Ghai [15] who found that the incidence of low birth weight infants was higher in mothers less than 20 years of age. Leppert et al [16] found that maternal age remains a significant predictor of birth weight but Cooper et al [17] reported that maternal age was not an independent risk factor for Small for

The data obtained were subjected to one way ANOVA using SPSS version 20.0 software. A posthoc tukey test was done to compare the mean value between two different groups.

gestational age babies. Gortzak et al [18] found that teenage pregnancy was associated with low birth weight while Bereczky et al [19] reported a highly significant decrease of mean fetal weight in those aged more than 35 yrs. Another study suggested that causation of LBW is maternal age (<18 yrs and >35 yrs)[20].

Mwabu(2008) and Okurut(2009) found mother's age to have positive significant impact on birth weight.[21,22]. The positive association between maternal age and LBW which is largely due to the health depreciation effect is consistent with Vahdaninia et al(2008) who found same for Iran[23]. In a study by P.De Carvalho et al it was found that maternal age contributed negatively to birth weight [24]. In contrast Fedrick [25] and Dougherty and Jones [26] found that age was not a significant factor in determining the birth weight of babies. In a study by Gagan Agarwal et al [27] the prevalence of LBW among mothers aged <18 yrs was 42.86% and those > 35 years 33.33%. A LBW prevalence of 39.1% was found in urban areas of Delhi, the maternal age was identified as a significant determinant [28]

A significant difference in the perinatal mortality was observed in the 31 years and above group compared with those less than 30 years in a perinatal mortality survey in India [29]. An increase in perinatal mortality rate with increasing age was found in our study, but the difference was not found to be statistically significant. Reichman and Pagnini [30] found that risk of infant mortality increased with increasing age of the mother. Yoder and Young [31] found no difference in the incidence of low birth weight or neonatal survival in the different age groups. DuPlessis et al [32] found that maternal age at delivery is significantly associated with low birth weight and premature births but they found no relationship between maternal age and infant mortality. In a study by Hansen [33] it was found that the still birth rate seems to double by the late 30's. In our study the perinatal mortality was found to be double in the age group 30-39 (56.6 / 1000 live births) compared to that of the age group less than 20 years (20.68/1000 live births) but the difference was not statistically significant .

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