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STUDY OF SEX RATIO AT BIRTH AMONG DELIVERIES CONDUCTED IN G.M.H REWA, A RETROSPECTIVE STUDY

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HOW TO CITE THIS ARTICLE:

Shashi P. Tomar, Kushwah S. S, Avadhesh P. S. Kushwah. "Study of Sex Ratio at Birth Among Deliveries Conducted in G.M.H Rewa, A Retrospective Study". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 16, April 21; Page: 4325-4330, DOI: 10.14260/jemds/2014/2438

ABSTRACT: The deficit of women has progressively increased as evident from the sex ratio of the population; more or less steadily declined over the span of hundred years from 972 in 1901 to 933 in 2001. Declining sex ratio is a important social issue need to be urgently addressed so the present study was conducted to find out sex ratio at birth among deliveries conducted in G.M.H Rewa during year 2005 and To find out sex ratio at birth among mothers of different educational statuses, among rural and urban mothers and at different birth orders. **MATERIALS AND METHODS:** The birth register of year 2005 in Department of obstetrics and gynaecology labour room was used as primary source of information. Data was recorded in Computerized MIS provided by UNFPA Bhopal regarding following study variables: Sex at birth, Birth outcome, Viability of new born at birth, Birth weight of new born, Mode of deliveries, Residence of mother, Educational status of mother, Age of mother, Occupation of mother Religion of mother, Gravidae, Parity (No of surviving children including current one). Data compilation and analysis was done in department of community medicine S.S. Medical College. **RESULTS:** The sex ratio at birth for total deliveries was 910. Sex ratio at birth for deliveries of rural mothers was 922 and of urban mothers was 883. Sex ratio at birth among illiterate group of mothers (1174) and for literate mothers it was 836. **CONCLUSION:** Sex ratio at birth was lower among educated mothers as compare to uneducated mothers and it was found lower for urban mothers as compare to rural mothers.

KEYWORDS: Sex ratio, mother's education & residence, birth order.

INTRODUCTION: Sex ratio defined here as the number of females per 1000 males in the population.¹ It is an important social indicator to measure the extent of prevailing equity between males and females in a society at a given point of time. The deficit of women has progressively increased as evident from the sex ratio of the population; more or less steadily declined over the span of hundred years from 972 in 1901 to 933 in 2001.² It is mainly the outcome of the interplay of sex differentials in mortality, sex selective migration, sex ratio at birth and at times the sex differential in population enumeration and sex composition of population can change at every stage of life from birth to death so this is an important issue what the various factors are that can influence sex composition of population. A girl child is discriminated against in many ways - ranging from abandonment of girl children, fewer months of breast feeding, less of nurturing and play, lesser medical treatment if falls ill etc. all working against the very existence of girl child. Today, with the technological advancement in medical diagnosis this discrimination begins even before her birth. Various medical technologies have been put into practice to identify the sex of the child before the birth and selective abortion, if found female. The reasons behind the discrimination of girls crosses the spectrum of Indian regions, economic classes, and castes and are due to a complex mix of economic, social and cultural factors.

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Declining sex ratio has now been increasingly recognized as a complex and an urgent problem and needs to be addressed head on. So this study was designed with the following

OBJECTIVES:

- 1) To find out sex ratio at birth among deliveries conducted in G.M.H Rewa in one year duration.
- 2) To find out sex ratio at birth among mothers of different educational statuses, among rural and urban mothers and at different birth orders.

METHODOLOGY:

STUDY PROTOCOL AND DESIGN: A retrospective, record based observational study was conducted at Gandhi Memorial Hospital, affiliated to Shyam Shah Medical College Rewa Madhya Pradesh, India for a period of four months, from 1st to 31st October 2007. During this period hospital record of deliveries conducted 1st January 2005 until 31st December 2005 were reviewed. The birth register for the year 2005, as obtained from, labour room was used as primary source of information. The year 2005 was deliberately chosen for the assessment of hospital records as it represents the middle year of the decade (2001-2010), and thus the data generated could be used as tool to generate the results for decade. (Institutional ethical clearance was obtained prior to study.

DATA EXTRACTION: Available medical records reviewed with prior permission from the Department of obstetrics and gynaecology. Data was recorded in a computerized proforma (Computerized MIS software for retrospective study in Rewa). All missing data were confirmed from available case sheets in obstetrics and gynaecology department. Data compilation and analysis was done in department of Community Medicine Department of Shyam Shah Medical College Rewa. Information was collected regarding the all variables for the deliveries that occurred in year 2005: Sex of the baby at birth, birth outcome, viability of new born at birth, birth weight mode of deliveries, residence of mother, educational status of mother, age of mother at the time of delivery, occupation and religion of mother, obstetrics score etc.

Study Design: This is a retrospective observational institution based study.

Study unit: Hospital record of deliveries conducted in one year duration.

Study analysis: was done by using Percentage , proportions, Chi square test

RESULTS AND DISCUSSIONS: A total no of 4170 deliveries were recorded in one year in GMH Rewa during year 2005. Among total deliveries 97.60% mothers were of house wife, 1.56% were farmer mothers, 0.84% were of service class. Among total deliveries 24.77% deliveries were of illiterate and 76.23% were of literate (all primary and above). Among total delivery conducted during that year 69.02% were from rural area and 30.98% were from urban area.

Among 4170 deliveries 2183(52.66%) were male births and 1987(47.34%) were female births so the sex ratio at birth for total deliveries was 910. Sex ratio of Rewa district is 939 as per census 2001.²

Among total deliveries 83(1.99%) were stillbirths and among these 40(48.19%) were female stillbirths and 43(51.81%) were male stillbirths. So more stillbirths were found in male babies. Tan

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KC et al reported more stillbirths among male as compare to female in their study.³ Among total 4087 live birth deliveries were 52.36% male live births and 47.64% were female live births. Association between Viability at birth and sex at birth was not found statistically significant. [Table 1].

When sex ratio at birth among live births deliveries was calculated it was 909.8 (Fall in sex ratio at birth is only 0.2 than the sex ratio at births of total deliveries). These finding showed that sex ratio at birth was not much influenced by still births. So it is clear that less female babies as compare to male babies at the time of birth cannot be explained on the basis still births only. Less births of female baby indicates increased prenatal sex determination with subsequent selective abortion of female fetuses.⁴

The reason for male preference in India is most probably due to cultural values like to continue family lineage, to bring honor, old age security, and performing funeral rites. Similar study of male preference among mothers delivering at Patan Hospital Kathmandu cultural factors were found significant.⁵

Male and female births among various educational groups were shown in [Table 2B].

Among illiterate mothers male births were 45.98% and female births were 54.52%, among primary educated mothers male births were 55.42% and female births were 54.58%, among high school educated mothers male births were 48.86% and female births were 51.54%, among Higher Secondary male births were 54.49% and female births were 45.51%, among Graduate & above male births were 59.42% and female live births was 40.58%. This showed that female birth percentage was low among all literate groups as compare to male. Sex ratio at birth among illiterate mothers was 1174 while among literate mothers (primary and above) it was 836. Sex ratio at birth among various educational statuses was compared it was found favorable for females among illiterate group of mothers (1174) and for all the literate educational groups it was lower than illiterate group of mothers. [Table 2A].

So it can be interpreted from these data that literate mothers give birth to fewer female babies as compared to illiterate mothers. Fewer female births among literate mothers may be due to more use of antenatal sex determining technology among literate mothers but cause can't be exactly predicted as it is a record based study. In a similar study by Jha et al mothers with grade 10 or higher education had a significantly lower adjusted sex ratio (683, 610-756) than did illiterate mothers (869, 820-917).⁶

Most probable reason for this is most of literate women more strictly follow two child norm and family planning methods. In a similar study of sex ratio of birth There is evidence of sex-ratio-dependent family planning.⁷ Other reason the literate population of mothers belongs to higher Socioeconomic class. In a similar study of sex ratio at birth it was found that higher class female gave births to more male.⁸

Male and female births rural and urban deliveries were shown in [Table 3].

Among delivery of total rural mothers 52.01% were of male babies and 47.98% were of female babies. Among delivery of total urban mothers 53.10% were of male babies and 46.90% were of female babies. Sex ratio at birth was better among rural mothers (922) as compare to urban mothers (883). [Table 3].

Mothers belonging to rural areas tend to have more no of children as observed from records among total 2878 rural mothers deliveries third and higher order births were 733 (25.47%) while in 1292 deliveries of urban mothers it was 208(16.10%) so there are more chances of male as well as

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female births in rural mothers as compare to urban mothers. Second two child norm is more strictly followed in urban mothers as suggested by results among total 1292 urban births 50.62% were first order births, 33.28% were second order births, 16.10% were third and higher order births while among total 2878 rural births 41.07% were first order births, 33.46% were second order births, 25.47 % were third and higher order births. (Table 5)

Out of total deliveries 44.03% deliveries were of first birth order, 33.41% deliveries were of second birth order 14.53% deliveries were of third birth order, 5.78% deliveries were of 4TH birth order, and 2.25 % deliveries were of 5TH birth order. Among total births 22.56% were + 3rd order births. Pattern of sex at birth at each birth order was compared, it was found that at first order, 52.12% were male births, 47.88% were female births and Sex ratio at birth was 918, at second order, 53.41% were male births, 46.59% were female births and Sex ratio at birth was 872, at 3RD order, 50.83% were male births, 49.17% were female births and Sex ratio at birth was 967, at 4TH order, 51.87% were male births, 48.13% were female birth and Sex ratio at birth was 928, and at 5TH order 52.13% were male births, 47.87% were female births and Sex ratio at birth was 918. So it was observed sex ratio at birth was least at second birth order. [Table 4]. In a Similar of sex ratio at birth in United States. Linear regression and logistic analysis showed significant effects of birth order and paternal age on sex ratio in the white race data study.⁹

After first birth couple generally prefer to have desired sex (male) of next baby so use of sex selective technologies increases immediately after first birth as reflected by least sex ratio at 2nd birth order. Similar decrease was not observed 3rd and higher order births most probably due to high proportion of rural deliveries at higher order births and sex ratio at birth among rural deliveries was found better in study.

Jha et al⁴ found the adjusted sex ratio in India, if the first child was a girl was 759 per 1000 males and in contrast to this, it was 1102 females per 1000 males if the first were a boy.

CONCLUSION: Sex ratio at birth was lower among educated mothers as compare to uneducated mothers and it was found lower for urban mothers as compare to rural mothers. Sex ratio at birth was least for second order birth.

Limitation of Study: Since this is record based study, causal factors of decline in sex ratio at birth could not be studied. As this is hospital based study result cannot be generalized.

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Sex at birth/Viability at birth	Male	Female	Total(n)
Born alive	2140(52.36)	1947(47.64)	4087
Not born alive	43(51.81)	40(48.19)	83
Total	2183(52.66)	1987(47.34)	4170(100)
Sex ratio at birth among Total deliveries was 910			
Sex ratio at birth among live births deliveries was 909.8			
Table 1: Showing total deliveries and sex ratio at birth			

P value (0.920321 for d.f =1) is >0.05 not significant.

Education/Sex at birth	Male	Percentage	Female	Percentage	SR at birth
Illiterate	475	45.98	558	54.02	1174
Literate	1708	54.45	1429	45.55	836
Table 2A: Showing sex ratio at birth among literate and illiterate mothers					

Education/Sex at birth	Male	%	Female	%	SR at birth
Illiterate	475	45.98	558	54.02	1174
Primary	235	55.42	189	44.58	804
Middle	438	58.40	312	41.60	715
High School	514	48.86	538	51.14	1046
H.S	261	54.49	218	45.51	835
U.G but comp. H.S	14	77.77	4	22.23	286
Gr & Above	246	59.42	168	40.58	672
Total	2183	52.35	1987	47.65	911
Table 2B: Sex ratio at birth among various educational groups					

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Residence/Total no of birth of both sex	Male	Female
Rural(n=2878)	1497(52.02)	1381(47.98)
Urban(n=1292)	686(53.10)	606(46.90)
Sex ratio at birth in deliveries of rural mothers (922)		
Sex ratio at birth in deliveries of urban mothers (883)		
Table 3: Showing sex ratio at birth among rural and urban deliveries		

Figure in parenthesis are percentage

birth order/ Sex at birth	Male	Female	Sex ratio at birth
1	957(52.12)	879(47.88)	918
2	744(53.41)	649(46.59)	872
3	308(50.83)	298(49.17)	967
4	125(51.87)	116(48.13)	928
5 or more	49(52.13)	45(47.87)	918
Total	2183(52.35)	1987(47.65)	910
Table 4: Showing sex at birth among deliveries of different birth orders			

Figure in parenthesis are percentage

Birth order/ residence	Rural	Urban	Total
1	654(41.07)	1182(50.62)	1836
2	430(33.46)	963(33.28)	1393
3	160(15.50)	446(12.38)	606
4	17(7.78)	224(1.32)	241
5 or more	31(2.19)	63(2.40)	94
Table 5: Distribution of birth orders in rural and urban deliveries			

Note: In table 2-5 Distribution is of Total deliveries (4170) including stillbirths also

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Date of Submission: 21/03/2014.
Date of Peer Review: 22/03/2014.
Date of Acceptance: 02/04/2014.
Date of Publishing: 19/04/2014.