Induced abortion in India

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Induced Abortion in India: A Population Based Study

CONTEXT: In India study of induced abortion using complete birth history of women using a nationally representative survey is currently lacking. In India son preference is attributed to the rise in the incidence of induced abortion. Research that can provide induced abortion rates and maternal and social correlates can provide better insights in the issue of sex preference and induced abortion apart from providing a complete account of induced abortion for India.

METHOD: Complete birth histories of 90,303 ever married women between 15-49 years of age from the 1998-1999 National Family Health Survey were used to compute birth order-specific induced abortion ratios. This involved a great deal of data manipulation using syntax based computations. The influence of maternal and social variables was assessed using logistic regression.

RESULTS: The overall induced abortion ratio was 17.04 per 1,000 pregnancies. The lowest induced abortion ratio was 5.27 per 1,000 pregnancies for first birth order, increased to 25.81 for third birth order and then declined marginally and non-linearly. Education of women was the most important factor that was associated with induced abortion. Having first and second child late was related to previous induced abortion. Living in rural areas substantially reduced the odds of induced abortion. Nationally, sex of the previous child was not significantly associated with induced abortion. Increasing women's education would have profound implications to induced abortions in India. Unplanned and unintended pregnancies rather than sex of the previous child appears to be an important factor associated with induced abortion nationally.

[WORLD COUNT: 248]

INTRODUCTION

Unsafe induced abortion is one of the important causes of maternal morbidity and mortality globally, both in countries where induced abortion is illegal and also where facilities are not well developed or unevenly distributed (Jain et al, 2004; Singh and Sedgh, 1997). In India about 12% of maternal deaths are thought to be due to complications from induced abortions (Ministry of Health and Family Welfare, 1999). Further, in India, regardless of its legal status abortions have been provided either by modern or traditional providers. It is believed that there have been more illegal induced abortions than legal ones (Khan et al., 1998).

Globally more than half of the unintended pregnancies end in induced abortion. Thus, by preventing unintended pregnancies though effective contraceptive use could bring down the incidence of induced abortion (Bongaarts and Westoff, 2000; Thapa and Padhye, 2001). However, a complete elimination of induced abortion may not be realistic even with widespread use of effective contraception because the decision to abort is reached once pregnancy is established (Singh and Sedgh, 1997; Bankole, Singh and Hass, 1998). If sex preference is strong and sex selection techniques are widely accessible then induced abortion will be used for sex selection (Bairagi, 2001). An important reason for women undergoing induced abortion in India is thought to be due to son preference (Arnold et al., 2002). Induced abortion is believed to have increased with the availability of sex determining technologies in certain parts of India (Booth et al, 1994). If sex preference indeed is the main reason for induced abortion then there is lesser role of contraceptive services to curb induced abortion. Overemphasizing sex preference as a main reason for induced abortion in India may undermine the need to provide contraception to couples who desire to limit family size or to postpone a birth. Though small in size, studies have shown diverse reasons for induced abortion in India. For example, a study in Maharashtra showed that the need to space children as one of the reasons for adolescent girls choosing induced abortion; these women did not have prior experience

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of using contraception (Ganatra and Hirve, 2002). Another study in Tamil Nadu showed that non-consensual sex, sexual violence and women's inability to refuse their husband's sexual demands were the underlying causes for the need for abortions (Ravindran and Balasubramanian, 2004). Given the above background, the objectives of the present paper are (1) to provide birth order specific induced abortion ratio using a nationally representative survey and (2) to study the extent of association between induced abortion and maternal and social variables.

METHODS

Data from the 1998-1999 National Family Health Survey were used in the present study. This was a nationally representative population based sample survey of 90,303 ever-married women aged 15-49 from 26 states representing 99% of India's population and was undertaken by the International Institute for Population Sciences, Mumbai on behalf of Ministry of Health and Family Welfare, Government of India. The methods of the survey have been reported in detail in an overview report (IIPS and ORC Macro, 2000); the present study includes data from all the Indian states including Tripura, which was not included in the overview. The survey schedule included a complete birth history of each woman, the primary resource for the present study. The data were provided in anonymized form for academic use by ORC MACRO (Calverton, MD, USA), for which ethical approval was not required. Women may not have recalled details of induced abortion that occurred some time before the survey. However, during data collection details about induced abortions, miscarriages and stillbirths were sought as a part of a complete birth history for each woman, a method likely to enhance recall. Further, interviewers were specially trained to ask questions which could help distinguish induced abortions, stillbirths, and miscarriages. All induced abortions were used for estimation of birth order-specific induced abortion ratios, including those for women who had not yet had a live birth or induced abortions since last birth, ie women in 'open birth intervals'.

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For statistical models that included the influence of maternal age, only those induced occurring before a live birth were included as owing to the survey data structure maternal age at the time of a particular birth could only be estimated for 'closed birth intervals'.

Estimating Induced Abortion Ratio

The induced abortion ratio was defined as the number of induced abortions per 1,000 pregnancies (Henshaw, 1987). Ratios were calculated for each birth order from 1 to 7 and a single ratio for birth orders above 8 as the number of cases for each birth order over 8 was low such that the resulting birth order group contained fewer cases than any single previous birth order. Induced abortion ratio for first birth order refers to all induced abortions occurred before first live birth. This also includes all induced abortions reported by women who have not yet given a live birth. The denominator being all pregnancies (all induced abortions before first live birth; all stillbirths before first live birth; all miscarriages before first live birth and all first order live births). The second birth order includes all induced abortions occurred before second live birth. This also includes all induced abortions reported by women who have had one live birth but not yet had the second birth, i.e., women in an 'open birth interval'. Similar approach was taken for the remaining two birth orders. It may be noted that if there are more than one induced abortion in a particular birth order, they are considered having the same 'order' status. Similarly, twins are considered as two births.

Statistical Analysis

Logistic regressions were undertaken, one for each birth order up to four. Dependent variable was whether or not women had induced abortion in a given birth order period i.e., before first, second and so on. Maternal variables included in models were age at marriage and maternal age at the time of the subsequent live birth. Social variables included were sex of the previous child, educational status, a current standard of living index, religion, caste, and place of residence (urban or rural). In

order to identify multicollinearity among the variables collinearity diagnostic tests were carried out. In none of the cases were 'tolerance values' less than 0.2 and no variance inflation factor (VIF) was greater than 10. Interaction terms for age at marriage, age at birth were tested and found to be non-significant.

Definitions of Variables

'Age at marriage' refers to age at first marriage in completed years, grouped into three categories: below 15 years, 15-19 years, 20-24, and 25 and above. Owing to the structure of the data set it was not possible to obtain the mother's age at the time of an induced abortion. However, her age at the subsequent live birth could be calculated from the ages of her children, which were recorded in the survey schedule, and her current age. Educational levels of women were taken to be the highest grade completed. These were grouped as: no education, primary level, secondary, and higher level education. The standard of living index was derived from the following items: toilet facilities, source of lighting, main fuel for cooking, source of drinking water, a separate room for cooking, ownership of the house, ownership of agricultural land, ownership of irrigated land, ownership of livestock, and ownership of durable goods. These were grouped into low, medium and high categories. Details of scores used are available in the overview report of the NFHS-2. Other variables included in the analysis are self explanatory.

RESULTS

In the study population there were 17.04 induced abortions per 1,000 pregnancies. Table 1 shows the numbers of induced abortion by birth order with associated ratios. The lowest induced abortion ratio was found for the first birth order, and the highest for the third birth order. The relationship between induced abortion ratio and birth order was non-linear.

Table 1

Results of logistic regression results for 'closed birth interval' data are presented below and in Table 2.

Age at Marriage

Women's age at marriage was significant only in birth order 2 and 3. There were higher odds of induced abortion ratios at higher age at marriage compared to lower ages at marriage. For example, women married above 25 years of age had 2.07-2.38 times higher odds of induced abortion than women married below15 years of age. It is important to note that age at marriage was not significantly associated with induced abortion before first live birth. This indicates that women may not have induced abortion before first birth irrespective of their age at marriage because they want first child sooner. However, age at marriage influenced their subsequent induced abortions suggesting the probable role of unintended pregnancies.

Maternal Age at Next Live Birth

In general, the odds of induced abortion increased with an increase in maternal age at the subsequent live birth. For example, the odds of induced abortion among first order births were about 2.19 times greater at age 20-29 years compared to the under 20 age group. Above age 30 there were 2.44 times greater odds of induced abortion compared to the under 20 age group. The pattern was similar at all the four parities, except third birth order where it was not significant. This indicates that delayed live births are associated with previous induced abortion. This suggests that the need for spacing may have triggered the decision to undergo induced abortion.

Sex of Previous Child

Sex of previous child was not significantly associated with induced abortion in any of the birth orders. This corresponds to the earlier observation that unintended pregnancies may have been associated with the termination of pregnancies.

Education

Women's education was significantly associated with induced abortion in all birth orders. This was the most important factor associated with induced abortion. The odds of induced abortion was 3.67-6.70 times higher for higher educated women compared to illiterate women. This could be due to due to the increasing need to postpone next child to meet the demands of education, either peruse higher education or to take up employment. Other possible explanation is that educated women are more likely to have information and knowledge of abortion services compared to their less educated counterparts.

Standard of Living Index

For first order births, the odds of induced abortion for those in the medium standard of living index group were 1.45 times higher compared to women from the lower group. At the other birth orders there were no significant associations between standard of living and induced abortion.

Religion and Caste

Women's religious affiliation was not significantly associated with induced abortion in the first order birth. In the second and fourth birth order, Muslim women had 28-38% lower odds of induced abortion compared to Hindu women. Women's caste affiliation was not significantly associated with induced abortion in any birth order.

Place of residence

Women living in rural areas had about 39-52% lower odds of induced abortion compared to women living in urban areas. The lowest odds of induced abortion for women living rural areas were with second order births, the odds being 52% lower than for women living in urban areas.

Table 2

Results of logistic regression results for 'open birth interval' data are presented below and in Table 4. Open birth intervals are more likely to present recent cases of induced abortion.

Age at Marriage

Women's age at marriage was significant in all marriage groups. There were higher odds of induced abortion ratios at higher age at marriage compared to below 15 years age group. For example, women married above over 15 years of age had 1.20-1.40% higher odds of induced abortion than women married below15 years of age.

Sex of Previous Child

Sex of previous child was not significantly associated with induced abortion. Thus, this research provides no indication of sex preference that may have influenced induced abortion.

Education

Women's education was significantly associated with induced abortion. The odds ratios ranged between 1.89-2.07 for primary and above group compared to illiterates.

Standard of Living Index

Standard of living was significant with induced abortion. The odds of induced abortion for those in the medium and higher standard of living index group were 1.31-1.69 times higher compared to women from the lower group. This suggests the growing influence of standard of living on the adoption of sterilisation.

Religion and Caste

Muslim women had 18% lower odds of induced abortion compared to Hindu women. Women belonging to scheduled tribes were had 43% lower odds of induced abortion compared to women belonging to scheduled caste community. However, women not having any caste membership had 1.17 times higher odds of induced abortion compared to scheduled caste women.

Place of Residence

Women living in rural areas had about 43% lower odds of induced abortion compared to women living in urban areas. This perhaps shows the continuing lack of abortion facilities.

Table 3

DISCUSSION

The present analysis included all reported induced abortions and assigned them a birth order so the ratios reported here are based on the complete data set consisting 90,303 ever married women. It is likely that some under-reporting of induced abortion has taken place in this survey. However it is likely that the findings indicate a combination of limited access to and demand for induced abortion in the population at large. One of the limitations of the data set is that it does not include never married women whose induced abortion behaviors could be different from married women.

At national level, sex of the previous child in a closed or open birth interval did not have any significant association with induced abortion. This suggests that in a multivariate context where several other factors were taken into account, sex of the previous child, thus sex preference, is not an important predictor of induced abortion. In order to examine whether or not there exists any relationship in any particular State, separate analysis was carried out for major states (not shown). Haryana was the only state where sex of the previous child was significant in the multivariate analysis. In Haryana women who had a previous girl had the odds of induced abortion 1.82 times higher compared if the previous child was a boy.

This study indicates that unintended and unwanted pregnancies have lead to the termination of pregnancy: either to space children or limit fertility. Similar findings are reported from Nepal (Thapa and Padhye, 2001), Tamil Nadu (Ravindran and Balasubramanian, 2004) and Maharashtra (Ganatra and Hirve, 2002.). Nationally, easy access and good choice of contraception to women in lower parities may reduce unintended pregnancies which may reduce induced abortion. For higher parity women, unwanted pregnancies could be achieved through the provision of terminal family planning methods. However, some induced abortion may still be there as women's social and medical needs could change even after a planned conception which suggests the need for safe and accessible abortion facilities to women wanting to undergo abortion. Although not significant nationally, widespread of availability of sex determination technologies where preference for son is high may trigger induced abortions (Bairagi, 2001).

This study found women's education as the most important factor related to adoption of induced abortion. As women's education in India is likely to improve increase along with improved access to induced abortion an increased recourse to induced abortion is anticipated. As shown by Marston and Cleland (2003) desire to limit family size in the absence of effective and accessible contraception may also increase the adoption of induced abortion. In conclusion, contrary to the

view that sex preference predisposes induced abortion, this research shows that unintended and unwanted pregnancies prop up induced abortion. However, sub-regional influence of sex preference on induced abortion is unlikely to be captured in this study suggesting the need for further research on these issues.

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Table 1 Induced abortion ratios, India, 1998-1999

Birth order	Number of live births	Number of stillbirths	Number of miscarriages	Number of induced abortions	Total pregnancies	Induced abortion/1000 Pregnancies and 95%CI
1	80,378	2,634	5,680	470	89,162	5.27 (4.8-5.8)
2	67,448	1,352	3,409	1,270	73,479	17.28 (16.4-18.3)
3	48,489	871	2,167	1,365	52,892	25.81(24.5-27.2)
4	31,142	569	1,305	848	33,864	25.04(23.4-26.7)
5	18,878	359	750	516	20,503	25.16(23.1-27.5)
6	11,160	206	494	258	12,118	21.29(18.8-24.1)
7	6,191	134	289	169	6,783	24.91(21.4-29.0)
8+	6,387	116	272	144	6,919	20.81(17.6-24.5)
All	270,073	6,241	14,366	5,040	295,720	17.04(16.5-17.5)

Table 2. **Logistic regression showing variables influencing the odds of induced abortion by characteristics of women, closed intervals, India, 1998-1999**

Characteristics of women	Odd ratios (95%confidence intervals) and birth order (1-4)			
	1	2	3	4
Maternal variables				
Age at marriage				
Less than 15[a]				
15-19	1.48 (0.97-2.25)	1.60 (1.16-2.20)**	1.23 (0.89-1.69)	1.01 (0.68-1.48)
20-24	0.89 (0.52-1.51)	2.22 (1.56-3.16)***	1.48 (0.99-2.22)*	0.74 (0.40-1.35)
25 and above	1.01 (0.49-2.05)	2.38 (1.45-3.90)***	2.07 (1.40-4.12)*	0.39 (0.06-2.42)
Maternal age at next live birth				
Less than 20[a]				
20-29	2.19 (1.63-2.92)***	2.02 (1.59-2.56)***	1.02 (0.72-1.46)	2.56 (0.78-8.42)
30 and above	2.44 (0.97-6.15)*	2.04 (1.33-3.11)***	1.33 (0.80-2.20)	6.30 (1.84-21.62)**
Social variables				
Sex of the previous child				
Male				
Female	NA	0.96 (0.83-1.11)	0.92 (0.76-1.13)	0.90 (0.67-1.22)
Education				
No education[a]				
Primary	1.58 (1.08-2.32)**	2.39 (1.83-3.10)***	3.04 (2.24-4.14)***	1.85 (1.20-2.85)*
Secondary	2.27 (1.60-3.21)***	4.06 (3.19-5.16)***	5.01 (3.70-6.78)***	3.57 (2.33-5.45)***
High	3.67 (2.38-5.65)***	5.24 (3.90-7.03)***	6.70 (4.40-10.21)***	6.31 (3.26-12.21)***
Standard of living index				
Low[a]				
Medium	1.45 (0.99-2.12)*	1.05 (0.82-1.35)	1.05 (0.77-1.43)	0.94 (0.62-1.43)
High	1.38 (0.88-2.14)	1.31 (0.99-1.73)	1.32 (0.92-1.88)	1.55 (0.94-2.56)
Religion				
Hindu[a]				
Muslim	1.10 (0.77-1.56)	0.72 (0.55-0.95)**	1.07 (0.79-1.44)	0.62 (0.37-1.01)*
Others	0.83 (0.52-1.34)	1.05 (0.82-1.36)	1.45 (1.04-2.05)*	1.08 (0.57-2.03)
Caste				
Scheduled caste[a]				
Scheduled tribe	0.70 (0.33-1.47)	0.87 (0.56-1.33)	0.95 (0.57-1.57)	1.08 (0.55-2.13)
Other backward classes	1.11 (0.73-1.67)	1.17 (0.90-1.51)	0.97 (0.71-1.39)	0.98 (0.61-1.58)
Others	1.32 (0.89-1.97)	1.13 (0.88-1.46)	1.04 (0.75-1.44)	1.19 (0.74-1.88)
Residence				
Urban[a]				
Rural	0.60 (0.46-0.78)***	0.48-0.66)***	0.573 (0.46-0.72)***	0.61 (0.43-0.86)**
Number of births	**78,689**	**66,018**	**47,373**	**30,367**

Note: [a] is the reference category. * p<0.05; ** p<0.01; ***<0.001

Table 3. **Logistic regression showing variables influencing the odds of induced abortion by characteristics of women, open birth intervals, India, 1998-1999**

Characteristics of women	Odds ratios and 95% CI
Age at marriage	
Less than 15[a]	
15-19	1.20 (1.05-1.38)**
20-24	1.40 (1.12-1.64)***
25 and above	1.25 (1.00-1.57)*
Sex of the previous child	
Male [a]	
Female	0.95 (0.88-1.04)
Education	
No education [a]	
Primary	1.89 (1.68-2.15)***
Secondary	2.07 (1.84-2.34)***
High	1.93 (1.64-2.26)***
Standard of living index	
Low [a]	
Medium	1.31 (1.15-1.49)***
High	1.69 (1.45-1.97)***
Religion	
Hindu [a]	
Muslim	0.81 (0.70-0.93)**
Others	1.03 (0.89-1.18)
Caste	
Scheduled caste [a]	
Scheduled tribe	0.57 (0.46-0.71)***
Other backward classes	1.11 (0.96-1.27)
Others	1.17 (1.02-1.34)
Residence	
Urban [a]	
Rural	0.57 (0.52-0.63)***
Number of women	**79,037**

Note: [a] is the reference category. * p<0.05; ** p<0.01; ***<0.001