Gender bias in cardiovascular healthcare of a tertiary care centre of North India

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ABSTRACT

Objectives To analyse the gender bias in paediatric patients referred for free cardiac treatment as part of School Health Programme at a tertiary care centre in North India.

Methods A total of 537 children were referred for further management of congenital heart disease or rheumatic heart disease. Of these, 519 underwent cardiac intervention, and the data from their records were analysed retrospectively to determine any gender disparity in the utilisation of cardiac surgery.

Results Of the 519 children studied, only 195 (37.6%) were girls, while the remaining 324 (62.4%) were boys (male-to-female ratio of 1.66:1, p<0.0001), indicating a large gender divide. Gender bias was found to be prevalent across all the age groups irrespective of the type of cardiac ailment. Moreover, no statistically significant difference was found between the urban and rural populations (male-to-female ratio of 1.64:1 in rural and 1.71:1 in urban populations; p=0.823) in terms of gender disparity.

Conclusions Significant gender discrepancies exist in healthcare-seeking behaviour of patients in North India despite the provision of free cardiac treatment. An equal prevalence of gender bias in urban and rural communities points towards deep-rooted social norms beyond just the economic constraints. Healthcare policies ensuring equal treatment of male and female children should be promulgated to ensure a complete eradication of this social evil.

INTRODUCTION

Gender bias in paediatric healthcare has been reported from south Asia and China with sporadic reports from Africa and South America.[1] Gender-based differences in access to healthcare have been reported in various aspects of healthcare delivery, encompassing preventive, outpatient and inpatient domains of medicine.[2] The majority of published studies, however, have focused on the adult population, with studies from low/middle-income and developed countries highlighting sociocultural and diagnostic biases affecting equal access to healthcare.[3–12] These sociocultural influences are likely to impact the paediatric age group, for whom healthcare-seeking behaviour is dependent on societal norms and the gender preferences of the parents.[13 14]

Data on cardiovascular healthcare provision for female children in India are generally lacking. The few data available suggest that female children with cardiovascular diseases are less likely to receive appropriate management than their male counterparts, with this disparity being most apparent in those with lower socioeconomic status and education.[13] In fact, a study by Asfaw and colleagues highlights the gender of the patient as one of the prime determinants in healthcare demand and expenditure.[14]

In this study, we analysed the gender bias in the provision of free cardiac intervention at a tertiary care centre in North India.

METHODS

This is a retrospective study of children who were diagnosed with either a congenital heart disease (CHD) or a rheumatic heart disease (RHD) requiring cardiac intervention (surgical or device-based). As part of the School Health Programme operated under the scope of the National Rural Health Mission,[15] the children were diagnosed during the screening programmes carried out in the government and government-aided schools. They were then referred to higher healthcare centres for further treatment and/or cardiac surgery at no cost to the patient or their guardians.

This study was done at a tertiary healthcare centre in North India, which has been approved to provide cardiac care services to these children under this programme. It includes children who were referred to the hospital for treatment from 2009 to 2014. The data were collected from patient records and the following parameters were scrutinised: age of the child, gender of the child, domicile of the patient (rural/urban) and the type of heart ailment and the intervention done. The exclusion criteria included patients maintained on conservative medical management and those not deemed fit for surgery.

The data collected were then analysed using Statistical Package for Social Sciences (SPSS package) (IBM SPSS statistics V.20.0.0, 2011). Descriptive tables were generated to elaborate the findings while χ^2 test, one-sample non-parametric test (binomial test) and p value were applied to check the difference between variables.

RESULTS

A total of 537 children were referred to the tertiary care centre for further management of CHD or RHD. Of these, 519 underwent cardiac intervention while 18 were excluded and managed

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medically due to either being deemed unfit or for refusing cardiac intervention. Of the 519 children who underwent cardiac intervention, 195 (37.6%) were females and 324 (62.4%) were males.

On applying the one-sample non-parametric test (binomial test) for gender (with the null hypothesis assumption that the categories defined by gender as male and female occur with a probability of 50% each), it was found in the data that the probability of being a male was significantly higher than that of being a female ($p<0.0001$). This showed that there was a significant gender difference between the reporting patterns of children with heart ailments to the hospital for surgery under this governmental scheme.

The data showed that 60 children (11.56%) had RHD, while the remaining 459 (88.44%) were diagnosed as cases of CHD. Among the children with CHD who were referred, 27.45% had tetralogy of Fallot, 26.80% were diagnosed with ventricular septal defect (VSD), 15.6% had atrial septal defect (ASD), 8.06% presented with patent ductus arteriosus (PDA), while 22.00% had miscellaneous conditions that included multiple septal defects (various combinations of VSD, ASD, PDA), double outlet right ventricle, Ebstein's anomaly, total pulmonary venous return, partial anomalous pulmonary venous return, double chambered right ventricle, transposition of the great arteries, anomalous origin of left coronary artery from pulmonary artery, tricuspid atresia, single ventricle and sub-aortic membrane with aortic regurgitation.

On analysing the age of the patients at the time of first presentation to the centre, the mean age of the male patients was found to be 11.19±4.07 years, while that of the female children was 10.69±4.09 years. It was seen that gender bias was visibly present across all age groups (table 1).

Furthermore, the data pertaining to the type of domicile the patient resided in whether urban or rural was analysed. It was seen that a slightly higher ratio of male to female patients was seen in urban areas when compared with the rural areas. The corresponding ratios were 1.71:1 in the urban setting and 1.64:1 in the rural setting, with a p value of 0.823 (table 2).

Moreover, the patients were stratified according to the year in which they presented to the hospital. From these data, a male-to-female ratio for each year ranging from 2009 to 2014 was calculated, the results of which are shown in table 3.

On analysing the collected data, it was observed that the following parameters were not statistically significant in determining the likelihood of the patient receiving the free cardiac treatment: (a) age of the child, (b) type of cardiac ailment and (c) urban or rural residence. However, the gender of the child was statistically important in impacting the health-seeking behaviour among the North Indian population covered under this governmental programme.

Table 1 Patient stratification according to age

Age group	Number of females		Number of males		Total	
1–5	13	34.21%	25	65.79%	38	100%
6–10	75	32.89%	153	67.11%	228	100%
11–15	74	43.27%	97	56.73%	171	100%
16–20	31	39.24%	48	60.76%	79	100%
21–25	2	66.67%	1	33.33%	3	100%
Total	195	37.57%	324	62.43%	519	100%

X^2=5.857, p=0.210, df=4.

Table 2 Number of male and female children from urban and rural communities

	Male		Female		Total		Male-to-female ratio
Rural	233	62.13%	142	37.87%	375	100%	1.64:1
Urban	91	63.19%	53	37.87%	144	100%	1.71:1
Total	324	62.43%	195	37.57%	519	100%	1.66:1

X^2=0.050, p=0.823.

DISCUSSION

The prevalence of CHD in India has been reported at 2.25–5.2/1000 live births compared with 8–10/1000 live births in other parts of the world.[16–19] The male-to-female ratio of CHD prevalence in India has been variously reported as 1:1, 1.1:1 and 1.25:1.[20–23] Given the almost equal gender prevalence, it is alarming that relatively fewer girls are brought to the tertiary centres and even fewer are having the required corrective procedures done.

Similar studies have also reported significant gender gaps with the boys outnumbering the girls by a factor of 1.4:1[24] and only 44% of the girls undergoing required cardiac surgery compared with 70% of the boys.[13] In both these studies, female gender was identified as a major independent predictor of not receiving treatment, together with low socioeconomic class and the cost of surgery. Besides cardiac surgeries, even gender-based nutritional and immunisation biases have been reported from India.[25–29] In fact, medical expenditure for similar illnesses on healthcare services borne by families varied significantly between boys (Indian National Rupee (INR) 77) and girls (INR 45).[1]

In the present study, even with the availability of free treatment, females comprised only 37.6% of the total patient population. After factoring in the average enrolment of 46.38% for girls to 53.63% for boys in the government and private-aided schools,[30] there is still an absolute difference of 8.87% between the percentage of boys and girls. This may be attributed to the gender bias that parents have towards seeking even free treatment for their female children. As a result, the probability of the patient being a male was remarkably higher than that of being a female ($p<0.0001$), indicating a significant difference in the reporting pattern of children with heart ailments to the hospital for intervention.

The aforementioned data suggest that economic and financial reasons are not the only factors leading to gender discrimination and inequality in healthcare. Most of the subjects in the present study are school-going children from the various areas of Punjab in North India. The higher number of male children (male-to-female ratio 1.66:1) receiving free cardiac surgery should make

Table 3 Number of male and female children presenting each year from 2009 to 2014

Year	Boys		Girls		Total	Male-to-female ratio
2009	64	56.64%	49	43.36%	113	1.31:1
2010	157	65.15%	84	34.85%	241	1.87:1
2011	54	61.36%	34	38.64%	88	1.59:1
2012	18	56.25%	14	43.75%	32	1.29:1
2013	15	75.00%	6	25.00%	20	2.5:1
2014	15	62.50%	9	37.50%	24	1.67:1

us consider the existing social structures in this part of country. North India with its wheat-based agrarian economy has a dowry system, exogamous marriage patterns, lower literacy and educational levels of women, and seclusion of women, which may be responsible for the discrimination against women as compared with their south Indian counterparts.[31]

Deep-rooted social prejudices against girls, including differences in matrimonial prospects even after successful surgical procedures, lack of support from family and relatives for the treatment of girls and less conviction among parents of female patients to dedicate their time and resources, compared with those of male patients have been reported as some of the reasons for gender discrimination. The other reasons cited by Ramakrishnan *et al*[13] include concerns about a surgical scar on the chest of the female child, future matrimonial prospects and the need to conceal the illness of the child from relatives and friends.

Furthermore, the difference between the gender discrepancies between the urban and rural populations was determined not to be statistically significant. This finding reinforces the certitude of gender bias being pervasive among both rural and urban populations. This is despite the urban community's tendency to be more educated, having a greater employment rate and better access to basic amenities. On analysing the year-wise patient numbers and gender ratios, there was a year-wise decrease in the number of referrals, which was probably due to a change of personnel in the ministry regulating the norms and policies for patient referrals. Hence, political reasons could be a potential factor in the reduction of the number of referrals.

This study reveals the glaring disparity in healthcare provision for female children of any age in India despite elimination of economic constraints. Even more surprising is the fact that there is equal distribution of this gender-based discrimination in both urban and rural populations. Abolishing gender bias in child healthcare is a major challenge, especially in India where healthcare professionals are themselves products of this gender-biased culture. Corrective actions including the empowerment of women, education of female children, elimination of sex-selective abortions, and discussion at grass root levels about traditional culture and societal norms will go a long way in fighting this social evil. As physicians, it is our moral duty to draw attention to these existing gender discrepancies and ensure promulgation of policies in the healthcare system that will encourage the parents of female children to ensure equal delivery of health to their daughters. The National Rural Health Mission needs further cooperation from the public sector in order to fulfil its aim of providing comprehensive healthcare to very doorstep.

LIMITATIONS

It is imperative to mention that this study is primarily based on patients who were referred to the hospital by governmental personnel conducting these screening programmes. As such, no conclusions can be drawn regarding the nature of the epidemiological statistics of CHDs and RHDs in the overall population. Moreover, the study has been performed in a single tertiary healthcare centre in North India, which is one of the many approved centres by the School Health Programme. A compilation of the data from all the centres at a national level may further reflect the actual statistics. Furthermore, the total number of referred patients is not available to the authors; therefore, it is plausible that a fraction of the referred patients never reached the institute for further management. As a result, the patients who never sought further treatment may be unaccounted for in this study.

Key messages

What is already known about this subject?
Gender-based differences in access to healthcare are widely prevalent in the adult population in low/middle-income countries like India for which economic reasons have been cited.

What does this study add?
This study shows that gender bias affects the health-seeking behaviour of parents for their female children even when the medical services are being provided free of cost. Thus, there are many other factors well beyond only the economic ones, which lead to this discriminatory pattern.

How might this impact on clinical practice?
The deep-rooted social issues (beyond just the economic causes) need to be addressed by medical professionals as well as policymakers to ensure equal healthcare to both genders.

Competing interests None declared.

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