

Attitudes and perceptions about prenatal diagnosis and induced abortion among adults of Pakistani population

Muhammad Osman Arif^{1*}, Zafar Fatmi², Bhisham Pardeep¹, Tuba Ali¹, Hameed Iqbal¹, Haider Khan Bangash¹, Rushna Pervaiz¹, Hira Altaf¹ and Javed Ali Baba¹

¹Medical College, Aga Khan University, Karachi, Pakistan

²Department of Community Health Sciences, Aga Khan University, Karachi, Pakistan

Objectives Perception and attitude regarding prenatal screening and induced abortion vary across different populations. This study assesses the attitudes and perceptions regarding prenatal screening and induced abortion among Pakistani adults.

Methods We conducted a cross-sectional study among adults (18+) coming to the Aga Khan University Hospital, a private tertiary care hospital in Karachi, Pakistan.

Results Majority (65%) of the study population had knowledge about prenatal screening and it was acceptable to most (85.5%) of them. Significant proportion had high acceptance for induced abortion (23%) of a fetus that has serious congenital anomalies. On the other hand, 15% were unwilling to consider termination of pregnancy (TOP) in any circumstances. Women had more favorable attitude toward induced abortion. Most of the respondents (63%) were in favor of abortion if fetal death was imminent as a result of a congenital abnormality. Majority wanted mutual consultation of husband and wife for making decision regarding induced abortion (84%).

Conclusion There was a considerable discord in opinion about abortion in the study population. Health care providers should involve both parents in making decisions about abortions and counsel them adequately about congenital disorders. Copyright © 2008 John Wiley & Sons, Ltd.

KEY WORDS: prenatal diagnosis; induced abortion; Pakistan

INTRODUCTION

Screening fetuses for congenital abnormalities is now a common medical practice in the developed countries and in some developing countries. Considerable differences have been noted around the world in studies on attitudes of people toward prenatal diagnosis of congenital abnormalities and its influence on induced abortion (Halliday *et al.*, 1995; Mulvey and Wallace, 2000; Vergani *et al.*, 2002). Although the opinion on this sensitive matter may vary, trends indicate that induced abortion has become more acceptable in recent years (Leung *et al.*, 2004).

Abortion is illegal in many countries including Pakistan unless it is done to save the life of the mother. Abortion is generally considered to be culturally and religiously unacceptable in Pakistan. However, it is intriguing to note that the overall abortion rate is higher, 25.5 per 1000 women of reproductive age group, in Pakistan (Saleem and Fikree, 2001). This suggests that abortion is acceptable to people under certain conditions. Population-based estimates for induced abortion are generally unavailable for Pakistan. A hospital-based study in the city of Karachi, Pakistan, estimated that 2.4% of women underwent induced abortion during their reproductive period. It was also observed that most of the abortions were performed by unskilled health care

providers (Korejo *et al.*, 2003). Most of the women who underwent an induced abortion belonged to lower socio-economic group, had low literacy and large family size, and they were unable to afford more children (Korejo *et al.*, 2003; Hussain *et al.*, 2004).

Reliable estimates are not available on the burden of congenital abnormalities in Pakistan. Sketchy figures reveal an overall 5% occurrence of serious birth defects and an additional severe mental retardation as 1.1 per 100 live births (Gustavson, 2005). Common congenital abnormalities such as Down syndrome's incidence was estimated at ratio of 1 per 770 live births in Pakistan (Khan *et al.*, 2000). In Pakistan, consanguineous marriages are very common, which increases the risk of genetic abnormalities in the unborn child. Unwanted pregnancies at an older age are also a norm because of low contraceptive prevalence rate, posing a risk of chromosomal anomalies. Because of the lack of social support services in the community, the burden of mentally and physically challenged children falls completely on their parents, resulting in immense financial and psychological stress. It is also a social taboo to have a mentally disabled child which compounds the problem for the family.

A number of studies have investigated the factors that influence the decision to have an induced abortion in different populations. The visualization of congenital abnormalities by ultrasound before 24 weeks' gestation has a major impact on the decision to have an induced abortion (Drugan *et al.*, 1990). Most women opt to

*Correspondence to: Muhammad Osman Arif, Room 132, Aga Khan University, Male Hostel, Stadium Road, Karachi 74800, Pakistan. E-mail: osman_arif@hotmail.com

terminate the pregnancies with prenatal diagnosis of lethal conditions made before 24 weeks of gestation. The type of congenital defect and its severity were the determining factors in making the decision (Hassed *et al.*, 1993). Besides differences in rates among various countries, induced abortion rate also varies among different ethnic groups as had been observed in many societies (Pryde *et al.*, 1993; Drake *et al.*, 1996; Leung *et al.*, 2004).

To our knowledge, no study has been conducted to determine the attitudes of the population in Pakistan regarding induced abortion under condition of confirmation of an abnormal fetus. There was a need to investigate the discord between cultural and religious norms and the high rate of induced abortion in Pakistan. This study also explores the impact of religious conjunctions regarding induced abortion, the situations in which it may be acceptable and the factors that may influence people in making this decision. The study results may help us conduct further studies on this subject and will allow us to understand the perceptions of the population regarding this sensitive but important issue.

The objectives of our study were to determine the attitude and perception regarding prenatal diagnosis and induced abortion. Furthermore, we determined the factors influencing decisions regarding induced abortion in the presence of any abnormal prenatal findings.

METHODS

Setting

This is a cross-sectional survey carried out at the outpatient clinics of Community Health Center (CHC) and Consulting Clinics of the Aga Khan University, Karachi, a tertiary care hospital. Almost all the population understands Urdu language in Karachi. The CHC mainly consists of family practitioners and some specialists who conduct clinics at subsidized rates to cater to a low socio-economic class. Approximately 200 patients on an average visit the CHC per day. The Consulting Clinics consist of specialist clinics catering to a relatively higher socioeconomic class, with a patient burden of approximately 400 per day.

Participants

Any adult (18+) woman or man who could understand Urdu was included in the study. Patients were selected through the clinic registration using convenient sampling. Written informed consent was taken from the individuals and then they were assessed according to the inclusion criteria. Men and women were selected alternatively from the list, in order to have an equal number from both genders. None of the participants were related to one another in any way.

Questionnaire

The questionnaire started with the demographic details of the individuals. The questionnaire was divided into

three sections: section 1 was related to perceptions about prenatal screening. This part of the questionnaire was derived from a similar study conducted in Saudi Arabia (Babay, 2004). Section 2 presented chromosomal abnormalities including Down syndrome, Turner syndrome, Klinefelter syndrome, Edward/Patau syndrome, and thalassemia. The questionnaire gave brief descriptions of the outcome of such births followed by questions about their decision regarding induced abortion in these hypothetical situations. This section of the questionnaire was adapted from a study conducted in the Chinese population (Leung *et al.*, 2004). Section 3 was related to people's perceptions about induced abortion, with special emphasis on the conditions where induced abortion would be considered feasible and ethical. Furthermore, we inquired about the factors involved in decision making about induced abortion. This section of the questionnaire was also adapted from a study performed in the Chinese population (Leung *et al.*, 2004). In addition few more questions were added to fulfill study objectives. These included questions about the respondents' financial constraints and the ability to take care of a disabled child as reasons for induced abortion. The variables used in the final analysis were sex, marital status, level of education (bachelors and higher vs lower than bachelors), number of children (none vs one or more), monthly income (those with less than Rs. 20 000 vs those with more than Rs. 20 000), previous history of spontaneous and induced abortions, and history of mentally or physically challenged children in the family.

The questionnaire was administered by fourth year undergraduate medical students. The questionnaire was pre-tested on 40 individuals and necessary modifications were done. The questionnaire was made in English and translated into Urdu and then translated back into English to look for consistency of the translation process. The interviewers obtained written informed consent and informed the participants after the interview about abortion and the laws regarding abortion in Pakistan, keeping in mind the sensitivity of the subject.

The sample size was calculated using Epi-Info 6. A minimum of 385 individuals were required with the assumption of an anticipated awareness of induced abortion of 50%, level of significance of 5%, and a precision of 5%.

Data analysis

Data were entered in Epi-Info 6. SPSS (version 14.0) was used for analysis. Descriptive statistics of the sampled population was done. Both uni- and multivariate analyses were used. In section 2, the questionnaire used dichotomous variables, therefore chi-square test was used to determine associations between the responses and various demographic groups. A 5-point Likert scale was used for questions of section 3. The responses were scored as follows: 1 = strongly agree to 5 = strongly disagree, with 5 indicating the highest level of acceptance for abortion. In this section, *t*-test was used to find associations between the responses and various demographic characteristics. Multivariate analysis was

conducted to determine gender differential and influence of demographic factors on practices of induced abortion. These questions were asked in hypothetical situations of common congenital anomalies.

The protocol was reviewed by Ethic Review Committee of Community Health Sciences department of the Aga Khan University.

RESULTS

The demographic characteristics of the study participants are given in Table 1. Most of the respondents were married (82.9%) and of these 92.3% had a living child.

Majority of respondents (64.6%) were aware of prenatal screening and its use in diagnosis. Of these, (80%) were aware of ultrasound, but most of the respondents (76.5%) were unaware of the applicability of amniocentesis in prenatal screening. The acceptability of prenatal screening was high (85.5%). There was no significant

Table 1—Demographic characteristics of adults visiting outpatient department of a private tertiary care hospital in Karachi, Pakistan

Variables	Number (%)
Age	34.2 ± 10.15
Gender	
Male	171 (49.6)
Female	174 (50.4)
Marital status	
Married	286 (82.9)
Single	55 (15.9)
Divorce	4 (1.2)
Of those who were married	
Those who had children	264 (92.3)
Those who did not have children	81 (7.7)
Those who had had a spontaneous abortion	91 (31.8)
Those who had had an induced abortion	27 (9.4)
Those who had a child in their family who was mentally or physically challenged by birth	43 (15)
Ethnicity	
Urdu speaking	142 (41.2)
Punjabi	56 (16.2)
Sindhi	39 (11.3)
Pathan	48 (13.9)
Others	60 (17.4)
Level of education	
Illiterate	6 (1.7)
Primary	55 (15.9)
Secondary	70 (20.3)
Bachelors	140 (40.6)
Masters	71 (20.6)
Others	3 (1)
Monthly income (in Pakistani Rupees)	
<5000	26 (7.5)
5000–10 000	59 (17.5)
10 000–20 000	61 (17.7)
20 000–50 000	96 (27.8)
>50 000	103 (29.9)

difference regarding acceptability of prenatal screening among the different ethnic groups.

The acceptability of prenatal screening increases with the level of education, and it was highest among graduates (91.4%). The acceptability of prenatal screening increases with monthly income. The number of affected children in a family did not significantly affect the decision making regarding prenatal screening. A large percentage of the respondents (67.8%) believed that prenatal screening methods can successfully diagnose congenital anomalies. A small fraction (6.4%) of people did not accept prenatal screening because they did not consider termination of pregnancy (TOP) as an option. The main reason for not considering TOP was cited as religious belief.

Figure 1 shows the responses regarding congenital syndromes. Interestingly, the option to have an induced abortion was the most common response for all the questions. Edward/Patau syndromes had the highest percentage of respondents (56.6%) who wanted to have an induced abortion.

Overall, in all the questions asked, females had a more affirmative attitude toward induced abortion. There was a strong association between female gender and acceptance of induced abortion in case of Klinefelter syndrome ($p < 0.001$ using chi-square test). Similarly, overall, married people were more open to the idea of induced abortion compared with single respondents. Those who did not have a mentally or physically challenged child in their family were more likely to chose induced abortion in case of Edward/Patau syndromes ($p = 0.040$).

Respondents with a higher monthly income were favoring induced abortion compared with those who had lower monthly income in case of Edward/Patau, Klinefelter, and Turner syndromes ($p = 0.006$, $p < 0.001$, $p = 0.007$, respectively).

Multivariate analysis (Table 2) showed that being female and having children were associated with a greater acceptance of induced abortion in case of Turner syndrome. For Down syndrome, in addition to being female, those who were married and with a higher level of education were found to have a greater acceptance of induced abortion. Factors associated with higher acceptance of induced abortion in the case of Klinefelter syndrome were being female, married with no children, and having a higher level of education. For Edward syndrome, being female, married, and not having children were found to be significant factors for acceptance of induced abortion.

The respondents had mixed opinion about induced abortion in case the parents were unable to take care of the disabled child, with 40.0% in favor of abortion and 48.7% against it and 11.3% could not decide (Table 3). A very large proportion (82%) of respondents were against abortion in case the parents did not like the sex of the child.

Gender had an influence on the choice of answers. When in regard to the question in which the respondents were asked if women should not have the right to an abortion during the first trimester (12 weeks), males responded with a more negative attitude toward

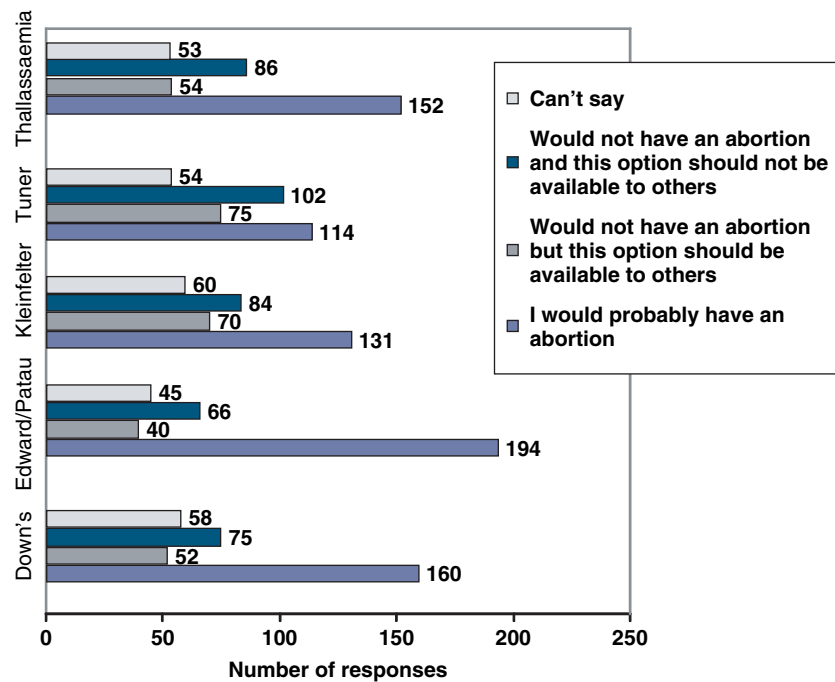


Figure 1—Frequency of responses for induced abortion in various congenital syndromes among adults visiting outpatient department of tertiary hospital in Karachi

abortion as compared with the female respondents ($p = 0.003$, males/females mean responses 2.79 vs 3.48). In the question in which the issue of whether females should not have the right to an abortion after 24 weeks, male responses were again more anti-abortion as compared with the females ($p = 0.007$, males/females means 2.14 vs 2.79). In the question in which financial problems were mentioned as a reason for abortion, males were yet again more anti-abortion than females ($p < 0.001$, males/females means 1.96 vs 2.27).

An overwhelming majority of the respondents (81.2%) said that the parents should work together in making the final decision to have an induced abortion. Respondents who had a higher level of education were more in favor that mothers should make the final decision about induced abortion when compared with those who were less educated ($p = 0.001$, means 3.53 vs 3.79). Similarly, those respondents who had higher monthly income were more in favor of the mothers making the final decision as compared with those with lower monthly income ($p = 0.001$, means 3.53 vs 3.95). High monthly income was also an important factor for a positive attitude toward induced abortion after 24 weeks of gestation ($p = 0.013$, means 2.57 vs 2.13). Acceptability of induced abortion was highest before 12 weeks of gestation (46.4%), decreased between 13 and 24 weeks (36.2%) and was least after 24 weeks (26.7%).

Table 4 shows the responses of the participants when asked about conditions diagnosed after 120 days of gestation. A higher education level was an important factor for a higher acceptance of induced abortion in case of non-lethal malformations, ($p = <0.001$, means 3.25 vs 3.81). Acceptability of abortion was highest for lethal malformations (60.9%), and lowest for non-lethal

malformations that required surgery after birth (22%) (Table 4).

DISCUSSION

Majority of the people were aware of prenatal screening and its use in diagnosis, but their knowledge was limited to ultrasound procedure only. Prenatal screening was highly acceptable and the acceptability of screening increases with the level of education and monthly income. These findings indicate a need for greater public awareness on this matter. These results are very similar to those received from pregnant Saudi Arabian women (Babay, 2004).

Induced abortion is illegal in Pakistan. Nevertheless, the option of having an induced abortion was the most common choice in all the questions regarding congenital syndromes. This indicates that many people are very open to this idea. Twenty-two percent (22%) of the respondents chose to have an induced abortion for the congenital syndromes discussed. On the other hand, 15% chose not to have an induced abortion and not to allow other women to do so. Compared with the European pregnant population (Drake *et al.*, 1996) where most opted for abortion, this population had mixed views. This indicates the need for open and wider discussions to be held in the community in order to reach a consensus. Edward/Patau syndromes, which are characterized by infertility, had the greatest percentage of respondents who chose to have an induced abortion. The problem of infertility in these conditions might be an important factor as there is a social taboo attached to these conditions in this society. Similarly, it has been observed

Table 2—Multivariate analysis to determine factors associated with acceptance of induced abortion among adults visiting outpatient department of private tertiary care hospital, Karachi

1. Keeping Turner syndrome total score as outcome, gender and number of children were found to be significant factors			
Variables	Beta value	95% confidence interval	<i>p</i> -value
Gender	0.195	0.226 to 0.731	<0.001
Number of children	-0.160	-0.651 to -0.142	0.002

2. Keeping Down syndrome total score as outcome, only gender, marital status, and education levels were found to be significant factors

Variables	Beta value	95% confidence interval	<i>p</i> -value
Gender	0.100	-0.15 to 0.498	0.065
Marital status	-0.115	-2.519 to -0.079	0.037
Level of education	0.110	0.52 to 2.429	0.041

3. Keeping thalassemia total score as outcome, only gender and number of children, and previous history of spontaneous abortion were significant factors

Variables	Beta value	95% confidence interval	<i>p</i> -value
Gender	0.191	0.218 to 0.733	<0.001
Number of children	-0.180	-0.714 to -0.191	0.001
Previous spontaneous abortion	0.093	-0.033 to 0.552	0.082

Table 3—Frequency of responses regarding questions of induced abortion among adults visiting tertiary care hospital in Karachi, Pakistan

Questions	Agree, <i>n</i> (%)	Cannot say, <i>n</i> (%)	Disagree, <i>n</i> (%)
Parents should not have the right to an abortion if they feel that they cannot take care of a disabled child	168 (48.7)	27 (7.8)	138 (40.0)
Parents should not have the right to an abortion if they dislike the sex of a baby	288 (83.5)	8 (2.3)	39 (11.3)
Parents should not have the right to an abortion for financial reasons	236 (68.4)	25 (7.2)	74 (21.4)
A woman should not have the right to an abortion in early gestation (before 12 weeks of gestation)	126 (36.5)	49 (14.2)	160 (46.4)
A woman should not have the right to an abortion in the mid-trimester gestation (13–24 weeks of gestation)	165 (47.8)	45 (13.0)	125 (36.2)
A woman should not have the right to an abortion after 24 weeks of gestation	192 (55.7)	51 (14.8)	92 (26.7)
Parents should work together for a final decision on the termination of pregnancy	280 (81.2)	27 (7.8)	27 (7.8)
During the process of considering termination of pregnancy, father's decision should be final	92 (26.7)	50 (14.5)	191 (55.4)
During the process of considering termination of pregnancy, mother's decision should be final	64 (18.6)	70 (20.3)	199 (57.7)
During the process of considering TOP, doctor should have the right to make the final decision	142 (41.2)	55 (15.9)	138 (40.0)

Table 2—Continued

4. Keeping Klinefelter syndrome total score as outcome, only gender, marital status, level of education, and number of children were significant factors			
Variables	Beta value	95% confidence interval	<i>p</i> -value
Gender	0.238	0.326 to 0.824	<0.001
Marital status	-0.74	-1.988 to 0.328	0.160
Level of education	0.65	-0.422 to 1.889	0.213
Number of children	-0.130	-0.565 to -0.067	0.013

5. Keeping Edward syndrome total score as outcome, only gender, marital status, and number of children were significant

Variables	Beta value	95% confidence interval	<i>p</i> -value
Gender	0.115	0.024 to 0.531	0.032
Marital status	-0.100	-2.308 to 0.62	0.063
Number of children	-0.089	-0.470 to 0.39	0.097

in previous studies that the severity and type of the disorder is a very important factor in parental decisions about induced abortion (Drugan *et al.*, 1990; Ahmed *et al.*, 2006).

It was interesting to note that females were more in favor of induced abortion as compared with males in case of congenital syndromes. This finding, which was not reported in previous literature, may be explained by the fact that because of the lack of social services in Pakistan, the main burden of caring for the mentally or physically challenged children falls on the mother.

Table 4—Frequency of responses to questions about conditions diagnosed after 120 days of gestation among adults visiting outpatient department of a tertiary care hospital in Karachi, Pakistan

In which of the following conditions would you consider termination of pregnancy after 120 days of gestation?	Agree, <i>n</i> (%)	Cannot say, <i>n</i> (%)	Disagree, <i>n</i> (%)
Lethal congenital malformation	210 (60.9)	56 (16.2)	69 (20.0)
Non-lethal structural malformation that requires postnatal surgery or medical therapy	76 (22.0)	75 (21.7)	184 (53.3)
Down syndrome	156 (45.2)	61 (17.7)	117 (33.9)

This emphasizes the need for the government to establish institutions which are meant to help such parents and provide them much needed physical and financial support. This is re-enforced by the finding that most people did not think that people should be allowed to induce abortion in case of financial difficulties or inability to take care of a disabled child.

The respondents' acceptability of induced abortion reduced as the duration of gestation increased. This indicates the need for early diagnosis and more widespread use of prenatal screening techniques, especially non-invasive methods such as ultrasound which had a higher level of acceptability. However, it must be noted that in previous studies done on actual subjects who were diagnosed to have fetuses with congenital abnormalities, time of diagnosis had no impact on the decision to terminate pregnancy (Drugan *et al.*, 1990; Hassed *et al.*, 1993).

It has been suggested that sex selection is being practiced in some parts of the world resulting in a higher male-to-female ratio (Shoham-Vardi *et al.*, 2004). The majority of the respondents agreed with the statement that TOP should not be performed for undesired fetal gender, even though male gender is preferred by most people in this population. Similar results were also seen in the Chinese population (Leung *et al.*, 2004).

The fact that most respondents were in favor of induced abortion in case of lethal malformations diagnosed before 24 weeks of gestation, and against induced abortion in case of non-lethal malformations, indicates the importance of severity of the condition in the decision-making process. These results are similar to that seen among Chinese women, 90% of whom were in favor of abortion for lethal congenital defects (Leung *et al.*, 2004). This emphasizes the need for proper genetic counseling so that the parents are well aware of the consequences of their decision. Most people agreed that both parents need to be involved in decision making. The question about doctors making the final decision produced mixed results. Therefore, it can be recommended that doctors need to make sure that both parents are involved in decision making but should be cautious when giving their recommendation.

When the results were compared among the two groups of individuals, those with and without affected children (abnormal, either physically or mentally), it was noticed that there was no significant difference in opinion. This came as a surprise because it was thought

that people with exposure to physically or mentally challenged children would be more in favor of induced abortion. This can be explained by the importance of religion and faith in this society, similar to the results obtained from a study done on Muslim subjects in Britain (Ahmed *et al.*, 2006). It was seen that among those who did not consider TOP as an option, the main reason cited for this was religious beliefs.

People have expressed reservations about induced abortion because of their religious beliefs, but at the same time are willing to consider induced abortion if they are made clear about the consequences of having an abnormal child. This emphasizes the need for proper genetic counseling during the pregnancy for both parents. The fact that a large proportion of the population is willing to have an abortion in case of mentally disabled children emphasizes the need for support agencies that will help parents in taking care of such children. It suggests that parents are anxious about the prospect of having to take care of a mentally or physically challenged child for his whole life and are thus more likely to opt for an abortion. It could be recommended that if abortion was not to be legalized, it is essential that proper support facilities be provided to parents of such children, so as to decrease the physical, psychological, and financial burden on the parents.

It must be kept in mind that the survey was conducted in a hospital-based setting for the convenience of the investigators and the results may differ from those collected from the general population. The respondents were only presented with hypothetical situations and it cannot be predicted with certainty that they would behave in the same manner in real situations. People who have not been exposed to mentally or physically challenged children may not fully understand the difficulties faced by parents of such children, and thus their responses may be biased.

CONCLUSION

The study concluded that the attitude of the Pakistani population towards induced abortion is mixed. Although some people are very open to this idea, others have strong reservations about induced abortion owing to their religious beliefs. Women are more likely to favor induced abortion compared with males. Most people

would opt for an induced abortion in case of lethal congenital abnormalities. People had a greater acceptability for induced abortion during the first trimester of the pregnancy than in the second and third trimesters.

On the basis of these findings, it is recommended that larger surveys should be conducted in the community setting in order to gather the opinion of the general population of Pakistan. Proper genetic counseling services should be made available in hospitals and maternity homes in the country. The government should provide support to parents of mentally and physically challenged children. Health care providers should be able to counsel the patients about congenital disorders and help the patients in making the decision involving both parents.

ACKNOWLEDGEMENTS

Muhammad Osman Arif conceived and designed the project. The data were collected, analyzed, and managed by all the authors collectively. The manuscript was written by Muhammad Osman Arif and Tuba Ali. Zafar Fatmi gave technical input in writing the manuscript and helped in the analysis. All authors reviewed, read, and approved the final manuscript.

REFERENCES

- Ahmed S, Atkin K, Hewison J, Green J. 2006. The influence of faith and religion and the role of religious and community leaders in prenatal decisions for sickle cell disorders and thalassaemia major. *Prenat Diagn* **26**: 801–809.
- Babay ZA. 2004. Attitudes of a high-risk group of pregnant Saudi Arabian women to prenatal screening for chromosomal anomalies. *East Mediterr Health J* **10**: 522–527.
- Drake H, Reid M, Marteau T. 1996. Attitudes towards termination for fetal abnormality: comparisons in three European countries. *Clin Genet* **49**: 134–140.
- Drugan A, Greb A, Johnson MP, *et al.* 1990. Determinants of parental decisions to abort for chromosome abnormalities. *Prenat Diagn* **10**: 483–490.
- Gustavson KH. 2005. Prevalence and aetiology of congenital birth defects, infant mortality and mental retardation in Lahore, Pakistan: a prospective cohort study. *Acta Paediatr* **94**: 769–774.
- Halliday J, Lumley J, Watson L. 1995. Comparison of women who do and do not have amniocentesis or chorionic villus sampling. *Lancet* **345**: 704–709.
- Hassed SJ, Miller CH, Pope SK, Murphy P, Quirk JG Jr, Cunniff C. 1993. Perinatal lethal conditions: the effect of diagnosis on decision making. *Obstet Gynecol* **82**: 37–42.
- Hussain M, Ashraf M, Noorani K. 2004. Alleged reasons and complications of induced Abortion. *J Surg Pak* **9**: 18–21.
- Khan NR, Saeed M, Cuckle HS. 2000. Antenatal screening for Down's syndrome in the second trimester. *Proc Shaikh Zayed Postgrad Med Inst* **14**: 53–56.
- Korejo R, Noorani KJ, Bhutta S. 2003. Sociocultural determinants of induced abortion. *J Coll Physicians Surg Pak* **13**: 260–262.
- Leung TN, Ching Chau MM, Chang JJ, Leung TY, Fung TY, Lau TK. 2004. Attitudes towards termination of pregnancy among Hong Kong Chinese women attending prenatal diagnosis counselling clinic. *Prenat Diagn* **24**: 546–551.
- Mulvey S, Wallace EM. 2000. Women's knowledge of and attitudes to first and second trimester screening for Down's syndrome. *BJOG* **107**: 1302–1305.
- Pryde PG, Drugan A, Johnson MP, Isada NB, Evans MI. 1993. Prenatal diagnosis: choices women make about pursuing testing and acting on abnormal results. *Clin Obstet Gynecol* **36**: 496–509.
- Saleem S, Fikree FF. 2001. Induced abortions in low socio-economic settlements of Karachi, Pakistan: rates and women's perspectives. *J Pak Med Assoc* **51**: 275–279.
- Shoham-Vardi I, Weiner N, Weitzman D, Levkovich A. 2004. Termination of pregnancy: attitudes and behavior of women in a traditional society. *Prenat Diagn* **24**: 869–875.
- Vergani P, Locatelli A, Biffi A, *et al.* 2002. Factors affecting the decision regarding amniocentesis in women at genetic risk because of age 35 years or older. *Prenat Diagn* **22**: 769–774.