

Prenatal Diagnosis in Low Resource Setting: Is It Acceptable?

Shalaby Hend Abdel Rahaman · Elhady Reda Abd ·
Gamal Anas Mohamed · Badry Ahmed Al

Received: 28 June 2011 / Accepted: 13 November 2011 / Published online: 3 October 2012
© Federation of Obstetric & Gynecological Societies of India 2012

Abstract

Aim This study aimed to explore knowledge and acceptability of prenatal procedures both non-invasive prenatal screening tests and invasive procedures among Egyptian women in childbearing age and to assess their attitude toward such procedures. Also to examine confounding factors affecting women's attitude toward prenatal procedures.

Study Design A cross-sectional study on a representative sample of women in childbearing age attending Obstetrics & Gynecology outpatient clinic at Mansoura University Hospital, Egypt. An anonymous questionnaire was supplemented by voluntary interviewers for women in childbearing age.

Results 465 women were included in the study. The mean age \pm SD was 27 ± 6 years. About 44 % of women were knowledgeable about non-invasive prenatal screening procedure, and only 25.5 % had heard about invasive prenatal procedures. 88.8 % express positive attitude regarding performance of the screening tests. Forty-one percent of the group agreed to perform invasive prenatal

procedures during their pregnancy. Educational level and family history of congenital anomalies significantly affected attitudes toward testing during future pregnancy. The cost of procedure affected the decision to perform in 56.7 % of women.

Conclusion Egyptian women express positive attitude toward non-invasive prenatal screening but showed poor knowledge. Their attitude toward invasive procedure is guarded by the risk of abortion. Education and family history of fetal anomalies are the factors that affect attitudes. The cost of the prenatal test affects the decision made by the women to participate in testing.

Keywords Prenatal procedures · Attitudes · Knowledge · Pregnancy termination

Introduction

Prenatal screening was first introduced nearly four decades ago, yet gaps still exist in public knowledge about the screening program [1]. Prenatal screening procedures are options available to women in both, the first (11–13 weeks) and the second (14–18 weeks) trimesters of pregnancy, aimed at identifying those at increased risk of birth defects and/or hereditary conditions, such as Down syndrome, neural tube defects (NTD), and some other fetal anomalies. Diagnostic procedures are invasive tests that carry a risk of miscarriage and can confirm, with 99 % accuracy, the presence of a chromosomal abnormality [2].

Shalaby H. A. R. (✉) · Elhady R. A. · Gamal A. M.
Department of Obstetrics and Gynecology,
Mansoura University, Mansoura, Egypt
e-mail: henshalaby@yahoo.com

Badry A. A.
Department of Community Medicine, Mansoura University,
Mansoura, Egypt

The general population is familiar with Down syndrome (trisomy 21), but they are not aware of more uncommon conditions such as Patau syndrome (trisomy 13) and Edward's syndrome (trisomy 18). They are aware of diagnostic testing from friends, TV/press, or because of family history [1]. Recent guidelines from the American College of Obstetricians and Gynecologists, and the American Society of Medical Genetics recommend that all pregnant women *have* to be offered prenatal screening for the most common aneuploidies [3]. No simple correlation has been found between the change in technology to the changes in values and beliefs toward genetic testing and prenatal procedures. Some think that genetic testing is a great advance while others think it will cause troubles [4].

The availability of information about prenatal screening and diagnostic procedures affects the choice of women of whether or not to undergo testing [5]. Limited information is available on how knowledge of prenatal screening, education level, and former experience of disability affect the decision to participate in prenatal screening [6].

Some modern Islamic opinion and rulings have accepted prenatal diagnosis and approved severe congenital anomalies and malformations, per se, as a reason for termination of pregnancy before ensoulment [7, 8].

This study aimed to explore knowledge, attitude, and acceptability of prenatal procedures (non-invasive prenatal screening tests and invasive procedures) among Egyptian women in childbearing age and to examine confounding factors affecting women attitude toward prenatal procedures.

Patients and Methods

A cross-sectional study on a representative sample of women attending Obstetrics and Gynecology outpatient clinic in Mansoura University Hospital between January 2011 and April 2011.

An anonymous questionnaire *was* supplemented by voluntary interviewers for the women in childbearing age after their consent to participate in the study. The structured questionnaire included information *about the* socio-economic variables and risk factors for fetal anomalies (maternal diseases and personal or family history of a child with anomalies).

The questionnaire included items about knowledge and attitude toward non-invasive prenatal screening (18 items) and invasive prenatal diagnostic procedure (8 items).

Statistical Analysis

Statistical analysis was carried out using the statistical package SPSS 16.0 for Windows (SPSS, Chicago, IL, USA). The means and standard deviations (SDs) *were*

calculated for continuous variables. An independent sample *t* test was used to evaluate the associations between continuous variables. Two-sided *p* value was considered statistically significant at $p < 0.005$.

Results

A total of 465 women of childbearing age were interviewed during the period from January 2011 to April 2011. Table 1 represents demographic data of the studied population, where mean age \pm SD was 27 ± 6 years and 8 % of the women were ≥ 35 years. Eight percent of the studied women had previous history of infertility, and 11.4 % had history of congenital anomalies either in their sibling or their family (Table 2).

About 44 % of women were knowledgeable about non-invasive prenatal screening procedure, and 88.8 % expressed positive attitude regarding performance of the tests (Table 3).

Forty-one percent of the group agreed to perform invasive prenatal procedures during their pregnancy. This figure declined to 31.6 % after explaining the procedure-related risk of miscarriage (Table 4). Only 25.5 % of women had heard about invasive prenatal procedures.

Nineteen percent of the interviewed women chose to terminate pregnancy after positive screening test results and 90 % refused, while 72.6 % of them chose termination if there was evidence of fetal anomaly that may result in

Table 1 Demographic data of the study group

	Number (465)	Percentage
Age (years)		
Mean \pm SD	27 \pm 6	
≥ 35 years	37	8
Occupation		
Employed	188	40.4
Not employed	277	59.6
Education		
Not educated	87	18.7
Primary and secondary school	184	39.5
Higher	194	41.7
Residence		
Urban	192	41.3
Rural	273	58.7
Religion		
Muslim	434	93.3
Christian	31	6.7
Consanguinity		
Present	61	13.1
Absent	404	86.9

Table 2 Obstetric and medical history of the participants

	Number	Percentage
Previous infertility		
Present	37	8
Absent	428	92
Abortions		
Present	153	32.9
Absent	312	67.1
Congenital anomalies		
Present	53	11.4
Absent	412	88.6
Maternal disease		
Present	81	17.4
Absent	384	82.6

Table 3 Knowledge and attitude toward non-invasive procedures

	Biochemical markers	Ultrasonic diagnosis
Knowledge		
Yes	202 (43.44 %)	225 (48.38 %)
No	263 (56.56 %)	240 (51.62 %)
Agree to perform		
Yes	367 (78.92 %)	413 (88.81 %)
No	98 (21.08 %)	52 (11.19 %)
Valuable		
Yes	364 (78.28 %)	405 (87.09 %)
No	101 (21.72 %)	60 (12.91 %)

Table 4 Knowledge and attitude toward invasive diagnostic procedures

	Number	Percentage
Knowledge		
Yes	119	25.59
No	346	74.41
Agree to perform		
Yes	192	41.29
No	273	58.71
Carry risk (agree)		
Yes	147	31.61
No	318	68.39

handicapping. This decision was influenced by educational level and history of congenital anomalies ($p = 0.001$ and $p = 0.000$, respectively). The presence of maternal disease, infertility, previous abortions, and occupation *did not* significantly affect women’s decision to terminate an affected pregnancy.

Table 5 Effect of occupation on knowledge

	Biochemical markers		US procedures		Invasive procedures	
	Ye	No	Yes	No	Yes	No
Employed (188)	102	86	130	58	87	91
Not employed (277)	100	177	95	182	66	211
Total	202	263	225	240	153	312
P value	0		0.001		0.003	

Table 6 Effect of education on knowledge

	Biochemical markers		US procedures		Invasive procedures	
	Yes	No	Yes	No	Yes	No
Non-educated (87)	17	70	13	80	10	77
Lower education (184)	67	117	70	114	49	135
Higher education (194)	118	76	142	52	94	100
P value	0.000		0.001		0.000	

Table 7 Effect of residence on attitude

	Biochemical markers		US procedures		Invasive procedures	
	Yes	No	Yes	No	Yes	No
Urban (192)	102	86	130	58	87	91
Rural (273)	100	177	95	182	66	211
Total	202	263	225	240	153	312
P value	0		0.001		0.003	

The cost of the prenatal procedure *affected* the decision of performing it by 56.7 % of the women, whereas in 43.3 %, *the cost did not affect their decisions*.

When we studied the factors that may influence knowledge and attitude toward prenatal procedures, we found that higher education, employed, and urban women were more knowledgeable (Tables 5, 6), *whereas* maternal ages, number of pregnancies, and the presence of congenital anomalies *did not*, significantly, affect women’s knowledge.

Urban women accepted the idea of prenatal procedures more than women living in rural areas (Table 7). Education significantly affected women’s attitude toward non-invasive tests, while no significant difference *in attitude was found* toward invasive procedure between the educated and non-educated women.

The presence of congenital anomalies either in their families or previous child significantly affected women’s attitude to undergo prenatal procedure in their future pregnancy (100 %, $p = 0.001$).

Discussion

Women favor prenatal examinations, but the choice of participation does not seem to be based on insight to enable fully informed consent. More than 90 % of the pregnant women expressed a positive attitude toward screening procedures in pregnancy. About 96 % were found knowledgeable about the procedural and practical aspects [9].

Unfortunately, the present study *showed* that *all surveyed women* had positive attitudes, but poor knowledge about prenatal screening. About 88 % of the studied group *accepted* prenatal screening, and 87 % found it valuable for the outcome of pregnancy. Knowledge about prenatal screening was found in 43.4–48.3 % of the studied group, whereas only 25.5 % were found knowledgeable about invasive procedures.

Forty-one percent of the studied group accepted to perform invasive prenatal diagnosis, but this declined to 31.6 % after explaining the risk of miscarriage. Willruth et al. [10] reported a higher acceptance, where only 21.5 % of their surveyed group refused to accept the procedures.

Factors such as education, maternal age, and religion affect the acceptability of prenatal diagnosis. In our study, educational level significantly influences women knowledge and their acceptance of prenatal screening but does not affect their acceptance of invasive procedures. Brajenovic et al. reported a statistically significant difference in knowledge scores with respect to educational level. In contrast, no difference was observed regarding their attitudes toward amniocentesis [11]. Julian-Reynier et al. [12] reported that educational level had no effect on acceptance of invasive diagnostic procedures.

Regarding residence, we found that women living in urban areas more knowledgeable and expressed positive attitude toward prenatal procedures than those living in rural areas. This difference may be explained by a higher educational level and the better availability of medical services in urban areas [13].

In our study, employment significantly affects knowledge about prenatal procedures, and this may be attributed to higher educational level.

Although Rostant et al. [14] found an association between increasing women's age and the number of pregnancies with knowledge and attitude toward prenatal tests, our study found that those variables were *not significantly affecting both* knowledge and attitude.

One of the important factors that may influence knowledge and attitude toward prenatal tests was the *history of congenital anomalies*. Such women expressed positive attitude (100 %) to perform testing in their future pregnancy. Although they have poor knowledge, these findings were reported by different authors [8, 15].

In different countries, prenatal care is free of charge and a part of general health care. However, there is a fee for first trimester prenatal screening as this is considered an optional service [6]. In our hospital, only ultrasonic prenatal screening is free of charge and when discussing the cost of biochemical markers and invasive procedure with the interviewed women 56.7 % found the procedures expensive and their costs affect the decision to perform them during pregnancy.

Acceptance of termination of pregnancy for severe clinical conditions was comparable to that reported from European countries (72.6 %) [16]. In our study, this decision was significantly affected by educational level and history of congenital anomalies. Japer et al. (2000) reported high level of opposition to termination of pregnancy in the event of severely affected fetus (61.8 %), but he found educated women had willingness for pregnancy termination more than those less educated if they faced an affected fetus [17]. The majority of our groups were Muslims and this does not influence their attitude toward pregnancy termination for severe fetal anomaly.

References

1. Rostant K, Steed L, O'Leary P. Survey of the knowledge, attitudes and experiences of Western Australian women in relation to prenatal screening and diagnostic procedures. *Aust N Z J Obstet Gynaecol.* 2003;43(2):134–8.
2. Al-Jader LN, Parry-Langdon N, William Smith RJ. Survey of attitudes of pregnant women towards Down syndrome screening. *Prenat Diagn.* 2000;20:23–9.
3. ACOG Committee on Practice Bulletins. Screening for fetal chromosomal abnormalities, ACOG Practice Bulletin No. 77. *Obstet Gynecol.* 2007;217:109–202.
4. Kitsiou-Tzeli S, Petridou ET, Karagiouzis T, et al. Knowledge and attitudes towards prenatal diagnostic procedures among pregnant women in Greece. *Fetal Diagn Ther.* 2010;27(3): 149–55.
5. Dahl K, Kesmodel U, Hvidman L, et al. Informed consent: providing information about prenatal examinations. *Acta Obstet Gynecol Scand.* 2006;85(12):1420–5.
6. Stefansdottir V, Skirton H, Jonasson K, et al. Effects of knowledge, education, and experience on acceptance of first trimester screening for chromosomal anomalies. *Acta Obstet Gynecol Scand.* 2010;89(7):931–8.
7. Hedayat KM, Shooshtarizadeh P, Raza M. Therapeutic abortion in Islam: contemporary views of Muslim Shiite scholars and effect of recent Iranian legislation. *J Med Ethics.* 2006;32(11): 652–7.
8. Babay ZA. Attitudes of a high-risk group of pregnant Saudi Arabian women to prenatal screening for chromosomal anomalies. *East Mediterr Heal J.* 2004;10:4–5.
9. Dahl K, Kesmodel U, Hvidman L. Informed consent: attitudes, knowledge and information concerning prenatal examinations. *Acta Obstet Gynecol Scand.* 2006;85(12):1414–9.
10. Willruth A, Vieten J, Berg C, et al. Decision making and attitudes towards invasive prenatal diagnosis in the early second trimester. *Ultraschall Med.* 2010;31(5):515–9.

11. Muhsen K, Na'amnah W, Lesser Y, et al. Determinates of underutilization of amniocentesis among Israeli Arab women. *Prenat Diagn.* 2010;30(2):138–43.
12. Brajenovic B, Babic I, Ristic S, et al. Pregnant women's attitudes toward amniocentesis before receiving Down syndrome screening results. *Women's Health Issues.* 2008;18(2):79–84.
13. Julian-Reynier C, Macquart-Moulin G, Moatti JP, et al. Attitudes of women of childbearing age towards prenatal diagnosis in south eastern France. *Prenat Diagn.* 1993;13(7):613–27.
14. Kishk NA. Knowledge, attitudes and practices of women towards antenatal care: rural-urban comparison. *J Egypt Public Health Assoc.* 2002;77(5–6):479–98.
15. Benn PA, Kaminsky LM, Ying J, et al. Combined second trimester biochemical and ultrasound screening for Down syndrome. *Obstet Gynecol.* 2002;100(6):1168–76.
16. Souka AP, Michalitsi VD, Skentou H, et al. Attitudes of pregnant women regarding termination of pregnancy for fetal abnormality. *Prenat Diagn.* 2010;30(10):977–80.
17. Jaber L, Dolfin T, Shohat T, et al. Prenatal diagnosis for detecting congenital malformations: acceptance among Israeli Arab Women. *IMAJ.* 2000;2:346–50.