

Prenatal Tests Undergone by Moslem Women who Live with an Abnormal Child Compared to Women who Live with Normal Child



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Abstract

Objective: To determine whether Moslem women with an abnormal child at home perform more prenatal tests and pregnancy termination compared to Moslem women who had only a normal child at home.

Study Methods: Moslem women (704) participated; 67% (470) lived at home with an abnormal child; 33% (234) only with a normal child. Of the women with an abnormal child, 50% lived in the cities, 47% were nonreligious, 49% had no academic education, and most (95%) had experienced a natural pregnancy. Of the women with a normal child, 49% lived in the cities, 44% were religious, and 50% had no academic education, most (80%) experienced a nonspontaneous pregnancy. Ages: 18-42 (mean 31).

Results: Most women with an abnormal child experienced spontaneous pregnancy; however, only 8% were aware of an abnormal fetus. Women with a normal child had experienced a nonspontaneous pregnancy (80%), however, most (97%) had undergone prenatal testing and chose to terminate the pregnancy ($p < 0.001$) due to an abnormality.

Conclusion: Moslem women who live at home with a normal child, performed significantly more prenatal tests and terminated most pregnancies when diagnosed with an abnormal fetus, compared to women who lived with an abnormal child. Most of the women with a normal child experienced a non-spontaneous pregnancy which could explain why they received more counseling relating to existing prenatal tests.

Keywords: Moslem women; Prenatal tests; Pregnancy termination; Spontaneous pregnancy

Abbreviations: DS: Down syndrome; CVS: Chorionic Villus Sampling; AC: Amniocentesis; NC: Nuchal Translucency; AFP: Alpha Feta Protein; NIPT: Non-Invasive Prenatal Test

Introduction

The belief that "All is done by Allah" can be mitigated by appropriate medical counseling or health care. Specifically, a study performed in three Moslem countries (Egypt, Kuwait, and Tunisia) supported three different approaches towards the legalization of abortions: conservative, more lenient, and liberal, which led to the conclusion that a more liberal attitude relating to abortion is possible in Moslem nations, if traditional principles are taken into consideration [1]. A recent research study investigating the cultural aspects of prenatal testing found that women of Pakistani origins living in northern England, chose not to undergo invasive testing due to the risk of miscarriage and the difficulty in having to terminate the pregnancy following abnormal test results [2]. Similarly, another study found that Moslem women of Turkish origins were less likely to consider terminating the pregnancy, even if the fetus was diagnosed as abnormal, due to their religious

convictions regarding antenatal screening in pregnant women [3]. In 2015, a study carried out in the Netherlands focusing on Moslem Moroccan women reported that the pregnant women preferred to be accurately informed as to antenatal anomaly tests. They were also asked about their individual beliefs as to the value of life. The respondents felt that counselors must explore their clients' moral values relating to quality of life and its termination, as well as how their religious beliefs affect these values [4]. In a Moroccan study, women who had given birth to a Down Syndrome (DS) infant were surveyed. Most were unaware that prenatal screening could have tested for this syndrome. The majority (94%) felt that information relating to DS screening must be provided to Moroccan women in the early stages of pregnancy and that a public health program for prenatal screening should be reestablished [5]. Definitive diagnostic testing during pregnancy is an invasive procedure, i.e., Chorionic Villus Sampling (CVS) or

Amniocentesis (AC). CVS is performed between 10 to 13 weeks of gestation; AC between 16 to 20 weeks. Both procedures carry a small risk of miscarriage. The degree of risk is commonly quoted as 0.5-1%, although, recent meta-analyses have suggested that the actual procedure-related risk may be much lower. Chromosomal abnormalities can be diagnosed in cells obtained from the invasive procedure by karyotyping or at a higher resolution by microarray analysis. The aim of prenatal screening for fetal chromosomal abnormalities is to identify women who are at a higher risk of carrying an affected fetus. Moreover, it enables the parents to make informed decisions as to whether to proceed with further diagnostic testing. Clinically significant fetal chromosomal abnormalities generally involve losses or gains of genetic material ranging in size from small segments of chromosomes (termed microduplications or microdeletions) to entire chromosomes (i.e., aneuploidy) [6]. The first recognized prenatal screening test, the alpha feta protein, was based on a single maternal serum marker of a neural tube defect. Subsequently, various prenatal screening concepts have been introduced, the most successful being the DS risk estimation using multiple serum and ultrasound markers [6-8]. However, and despite the importance of undergoing invasive procedures in pregnancy, as noted earlier, women from diverse ethnic groups espouse different attitudes and beliefs towards these tests. The Non-Invasive Prenatal Test (NIPT) analyzes the short DNA fragments from the placenta released into the plasma from normal cellular turnover that are rapidly cleared from circulation. In a pregnant woman, most of the DNA is derived from the turnover of the maternal cells. However, a proportion are derived from the outer trophoblast cell layer of the placenta, typically reflecting the fetal genotype. The percentage of this DNA is termed "fetal fraction". There is a wide normal range of fetal fraction. The median value at 10 weeks is ~10% fetal DNA fraction from the maternal DNA, yielding the approximated risk for a limited number of syndromes, specifically, DS [6,9]. Most of the Arab population (93.2%) in Israel comprise Sunni Moslems who reside mainly in towns and villages [10]. A prenatal diagnosis is accessible for many of the prevalent disorders found in the Israeli Jewish and Israeli Arab communities and are performed in the majority of maternity hospitals in Israel. Since, the entire Israeli population are covered by health insurance, prenatal testing for women at risk is free. Recently, a study conducted in Israel amongst Arab Moslem women whose fetuses had been diagnosed with congenital anomalies, focused on the subjects' decision-making process regarding the termination of the pregnancy [11]. Further research conducted by Jaber et al. (2000) showed that amongst Israeli Moslem women who were at an increased risk of delivering malformed babies due to the high frequency of consanguinity, acceptance of prenatal testing was relatively low due to their "religious opposition" to terminating the pregnancy pursuant to such guidance by health professionals [12]. It is worth noting that only a limited number of studies reporting on prenatal attitudes and pregnancy termination have been conducted within the Israeli Moslem population, an ethnic minority characterized as more conservative, especially, regarding issues they consider as

"intimate and personal" [13-15]. Our main goal was to determine if there were any differences in attitudes towards performing prenatal tests and terminating a pregnancy in Moslem women who live at home with an abnormal child compared to women who live at home with only a normal child. Another goal was to examine whether additional support of medical professionals, especially genetic counsellors, nurses or medical doctors are warranted.

Methods

Moslem women (704) from different cities and villages participated in this study; 67% (470) lived at home with an abnormal child and 33% (234) lived at home with only a normal child. Half of the women who lived at home with an abnormal child lived in cities, 47% were nonreligious, and 49% had received an academic education. Most (95%) had experienced a natural pregnancy. The women who lived at home with only a normal child, 49% lived in cities, 44% were religious, and 50% had not received an academic education. Most (80%) had experienced a non-spontaneous pregnancy. The women's ages ranged from 18 to 42 (mean age, 31). The mean age of the women with an abnormal child was 27, whereas the mean age of those with only a normal child was 39. The questionnaire was anonymous and included a short description and the goals of the study. In addition, informed consent was requested and specified that the woman's privacy would be protected. The questionnaire was distributed to public health nurses working in different clinics in Moslem cities and villages. The first part of the questionnaire included demographic details and the participants were asked to list the specific prenatal tests that had been performed during her last pregnancy. The second part dealt with the different prenatal tests and pregnancy termination. The third and last part dealt with the support of the husbands, family, and friends. All the prenatal tests that were listed in the questionnaire belong to the free health and drug basket; only the NIPT is a private test, which has to be paid for. The Ethics Committee of the institution, #1039 approved the study.

Statistical analysis

Statistical analysis was performed by SPSS software, version 28, linear and logistic regression tests with manifold embedding, the chi squared test, regular inferential statistics with the non-independent t-test, and the Pearson correlation test.

Results

Women with an abnormal child living at home had experienced mostly spontaneous pregnancies (95%), however, only 8% were aware that they were carrying an abnormal fetus (due to prenatal testing); the other 92% were unaware. The majority of women with a normal child living at home had experienced non-spontaneous pregnancies (80%), but most (97%) were aware that they were carrying an abnormal child due to the different prenatal tests they had performed, choosing not to terminate their pregnancy ($p < 0.001$). Most of the women with a normal child living at home underwent the different prenatal tests, i.e., nuchal translucency (NT) or alpha feta protein (AFP) (39%), CVS or AC (34%), and the

NIPT (9%). In contrast, only 21% of the women with an abnormal child living at home underwent NT or AFP, 3% - CVS or AC, and only 1%, the NIPT. The total difference between the two groups in undergoing prenatal tests was significantly high ($p < 0.001$, Table 1). A positive correlation was found between the undergoing of the different prenatal tests (NT, AFP, CVS, AC, NIPT and US), and the termination of the pregnancy after detecting an abnormal fetus ($p < 0.001$, Figure 1). From this correlation, we concluded that women with a normal child living at home undergo significantly more pregnancy terminations than women with an abnormal child. We found that the women who lived in the city were older and more educated, were more likely to undergo different

prenatal tests ($p < 0.001$) and tended to terminate the pregnancy after invasive tests ($p < 0.001$). The woman who was older, lived in a village, had no academic education, was more religious, was more frequently counselled by a religious authority regarding prenatal results ($p < 0.001$). The woman who was younger, lived in the city and received an academic education, tended to receive more support from her family, friends and husband ($p < 0.001$). The woman who was older, lived in a village, had received no academic education, was aware of society's negative opinions regarding terminating a pregnancy when diagnosed with a malformed child ($p < 0.001$).

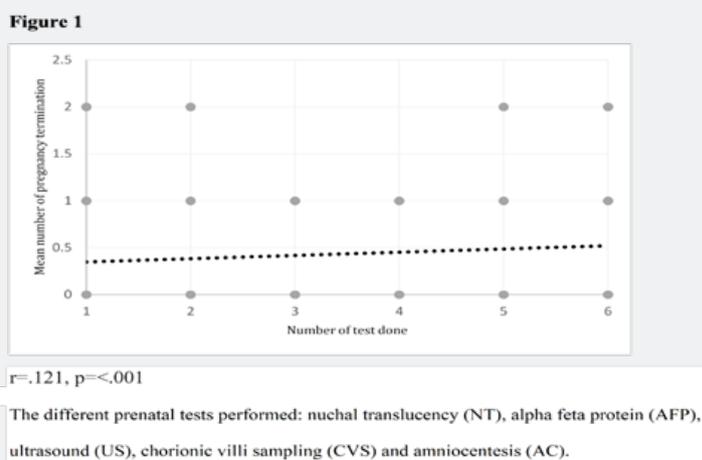


Figure 1: Positive correlation between performing different numbers of prenatal tests and the proportion of pregnancy terminations from all the pregnancies.

Table 1: Prenatal tests in women with a normal child compared to women with an abnormal child at home.

	Women with a Healthy Child		Women with an Abnormal Child		
	%	N	%	N	
Did not undergo any testing	18%	209	76%	1789	-
Nuchal translucency +AFP	39%	457	21%	483	(501, $p < .001$.-21 = (702) (T
Chorionic villi sampling+ amniocentesis	34%	394	3%	77	(159, $p < .001$.-30 = (702) (T
NIPT	9%	110	-	1	(, $c = 0.668$ 130, $p < .001$.314 = (2,1) (χ^2)

NIPT (non-invasive prenatal test); AFP (alpha feta protein)

Discussion

Herein, we questioned whether an abnormal child living at home would produce a change in the traditional attitude toward prenatal testing and pregnancy termination in Moslem society [2-5].

When compared to women with an abnormal child living at home, who had undergone more pregnancy terminations after the detection of an abnormal child.

we found that women with only a normal child living at home were older, had experienced significantly more non-spontaneous pregnancies, and underwent significantly more prenatal tests. It was also found that older women, those living in the cities and had received an academic education would undergo more prenatal tests and would terminate an abnormal pregnancy at a later date. We believe that older women should receive more information regarding prenatal testing because of their age and that more counseling services explaining these tests should be available

for the Moslem population. The correlation between academic education and undergoing the different prenatal tests has been previously described [16-18]. We found that women who had undergone an IVF procedure lived in the cities and had received an academic education. These women would undergo more prenatal tests than women who had experienced spontaneous pregnancies. We assume that the women who had undergone an IVF procedure, or other fertility treatments had received more information from various medical personnel, more readily available in cities than in villages regarding IVF and infertility procedures and the higher risk of genetic malformations, e.g., aneuploidy and imprinted diseases which are elevated during IVF pregnancies compared to normal spontaneous pregnancies [19-23]. The women are also updated on the different prenatal tests available including the NIPT. We found that most of the Moslem women who had undergone an IVF procedure or other infertility treatments lived in cities, were less religious, and had received an academic education compared with the Moslem women who had experienced spontaneous pregnancies, who lived predominately in the villages, were religious and had not received an academic education. Different studies have previously reported on the influence and positive correlation between an academic education and undergoing prenatal tests including the NIPT [16,17], the same findings as found in this study. It appears that women who underwent the IVF procedure and infertility treatments had more open-minded husbands, families and friends, were aware of new procedures and better understood the consequences of giving birth to and raising an abnormal child. It is also possible that younger people are more updated as to the new tests and procedures and receive more support from close families and friends. We found in this and in another study that women who were more religious, older and living in a village would rather consult with a religious authority regarding the different prenatal tests. Amongst Israeli Jewish women, it was reported that 94% of secular Jewish women, 36.4% of religious and none of the ultra-religious women >35 years, had undergone an invasive procedure [24]. Amongst the ultra-orthodox Jews in Israel, none had undergone prenatal diagnosis invasive tests, albeit, some had undergone only the most common screening tests, i.e., NT and AFP [25]. Women with an abnormal child living at home, probably did not terminate their pregnancy, even if they were aware that the fetus was abnormal. It is well known that pregnancy termination is forbidden in the Moslem world after the embryo has reached the first 120 days of pregnancy [26,27]. Indeed, studies focusing on Muslim women from western countries have highlighted the possible effects that cultural and religious factors play in their decisions, i.e., whether to undergo prenatal testing. Specifically, undergoing invasive prenatal tests, widely used in the general population, were more often limited amongst the Moslem women [6,7,18,24]. Recently, a study conducted in Israel amongst Arab Moslem women whose fetuses had been diagnosed with congenital anomalies, focused on the subjects' decision-making process regarding the termination of the pregnancy. It was found that in order to mitigate gaps,

physicians when communicating with their patients, must consider the social and religious factors that may affect the woman's decision-making process [11]. A research study [13] found that Israeli Moslem women are at an increased risk of delivering malformed babies due to the high frequency of consanguinity. Furthermore, the acceptance of prenatal testing was relatively low owing to their "religious opposition" to terminate their pregnancy pursuant to such guidance by health professionals [13]. This issue is supported by previous Israeli studies as to whether to terminate a pregnancy in Jewish women compared to Moslem women [28,29]. This finding was also supported by an Australian study performed in a Moslem population. Two main conclusions were reached: the women's partners and families played a crucial role in the acceptance of prenatal testing and that the women's perceptions and subjective experience with prenatal testing must be considered when providing more prenatal services. Moreover, this research reinforced the need for the women to be given a choice rather than being pressured and made to conform to the routinization of prenatal testing, only then, will one perceive a sympathetic and considerate health care system providing for all women in general and specifically, immigrant Moslem women [18]. It is also very important to increase counseling services, i.e., secular or religious in Moslem villages when making decisions as to a prenatal diagnosis and possible pregnancy termination which will increase the awareness of the population to the existing screening and invasive prenatal tests today and the option of pregnancy termination when an abnormal child is detected in the prenatal tests.

Conclusion

Moslem women who have only a normal child living at home undergo significantly more prenatal tests and termination of most pregnancies when diagnosed with an abnormal fetus, compared to women with an abnormal child living at home. Most of the women with a normal child experienced non-spontaneous pregnancy which could be due to receiving more counseling and explanations regarding existing prenatal tests. Also, they are older, received an academic education, and live in the cities where health professionals of all fields are more available.

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