

Knowledge and attitude towards prenatal screening for Down's Syndrome and other congenital anomalies among women of reproductive age group – A cross sectional study

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ABSTRACT

Introduction - Down's syndrome is the most common chromosomal abnormality; its risk increases with maternal age. It can be detected by screening tests during early pregnancy, most common being ultrasound scan. Women in the reproductive age group must be aware of prenatal screening methods.

Methodology - A cross sectional study was conducted to assess the knowledge and attitude towards prenatal screening for Down's Syndrome among women of reproductive age group in the urban population over a three-month period.

Result - Of the 175 persons studied (the minimal education was at least intermediate), 86% were aware about prenatal screening but only 46% knew that it had to be done in early pregnancy. 93.7% knew that ultrasonography was the screening tool to be used; 80.6% knew that Down's syndrome was a genetic disorder due to an extra chromosome 21.

Conclusion - A good proportion of women were aware of Down's syndrome, prenatal screening and its importance. Higher education has probably contributed to this knowledge enhancement. However, it is important to ensure that every woman in the reproductive age group is aware about antenatal screening for congenital anomalies.

Key words – Down's Syndrome, Prenatal screening, Congenital anomalies, Ultrasonography

Introduction

Down's syndrome or Trisomy 21 is the most common chromosomal abnormality seen at birth. More than 1 in 1000 newborn is affected by Down's Syndrome (Parker et al. 2010). It is considered to be the most common genetic cause for mental retardation. The effects of Down's Syndrome involve a range of medical conditions including cognitive impairment and intellectual disability in children and adults (Palomaki et al. 2009). Mental retardation (moderate to severe), physical disabilities and congenital heart anomalies like atrioventricular septal defect are some of the associated features.

Down's Syndrome is caused due to a meiotic accident or an inappropriate meiotic division. There occurs non-dysjunction of chromosome 21. The extra chromosome 21 leads to the physical features and developmental challenges that occur among people with Down syndrome. This can occur to any pregnant woman and the risk increases with maternal age (PW Yoon et al. 1996). Starting with 2007 the American College of Obstetrics and Gynecology (ACOG) recommends that screening for Down's Syndrome to be available for all pregnant women regardless of age (Wilson et al. 2013).

There is a wide range of Down's Syndrome tests that includes single tests or combination of several with varying rates of prediction. Down's Syndrome during pregnancy can be detected by screening tests and diagnostic tests. Screening tests usually include a combination of a blood test and an ultrasound scan. Diagnostic tests are usually performed after a positive screening test in order to confirm a Down's syndrome diagnosis. Types of diagnostic tests include chorionic villus sampling, amniocentesis and percutaneous umbilical blood sampling. The latest technological advancement is Non-invasive Prenatal Test (NIPT) which is an investigation based on the analysis of free circulating fetal DNA in the maternal blood and has a high predictability potential (Spencer 2014).

No treatment has been identified for Down's Syndrome. Antenatal screening and early diagnosis is the only way to prevent a mother delivering a Down's baby. Thus it is necessary for every woman belonging to reproductive age group to be aware about this condition, its risk factors and early screening and diagnosis. The study aims at assessing the knowledge and attitude towards prenatal screening for Down's Syndrome and other congenital anomalies among women of reproductive age group.

Methodology

A cross sectional study was conducted to assess the knowledge and attitude towards prenatal screening for Down's Syndrome among women of reproductive age group. The study was conducted among women of reproductive age group who belonged to the urban population in Kancheepuram district. The study duration was 3 months, followed by analysis and discussion. Inclusion criteria - Responses from women belonging to the reproductive age group (15 to 45 years), who were willing to be a part of this study were only taken into account.

Exclusion criteria - People with psychiatric illnesses and those who attained menopause were excluded from the study.

A total of 175 subjects between the age group of 15 and 45 years were interviewed in the study. Convenience sampling method was followed. The purpose of the study was explained to the participants and a written informed consent was obtained from them. A structured and pre-tested questionnaire with 20 questions was prepared and distributed among study participants. The responses along with basic sociodemographic details were collected, recorded and analysed. The questions were based on Down's Syndrome, prenatal screening practices, its importance, and necessity. Questions on other congenital anomalies were also included. Ethical approval was obtained from Institutional Research Board.

Statistics -Data obtained was entered into Microsoft Office Excel Spreadsheet and then analysis was done using SPSS software version 21. Response to each question was tabulated, analysed and percentage for the same was also calculated.

Results

A total of 175 responses were collected from women of reproductive age group. Majority of them belonged to the age group of 21 to 26 years (46.3%), and all of them had good educational qualification with 42.3% having completed their graduation and attained a professional degree (Table - 1).

Table – 1 – Demographic characteristics

Characteristics		N(%)
Age	15 - 20 yrs	41 (23.4)
	21 - 26 yrs	81 (46.3)
	27 - 32 yrs	18 (10.3)
	>33 yrs	35 (20)
Education	Intermediate / Diploma	101 (57.7)
	Graduate	53 (30.3)
	Professional degree	21 (12)

Among the 175 participants in the study, 141 (80.6%) have heard about prenatal screening (Table – 2). Out of the 141 who were aware of prenatal screening, 76% believed that prenatal screening was done to all pregnant women. Prenatal screening aims at identifying both structural and functional abnormalities in fetus. But 18.8% believed that prenatal screening was only to find out the structural abnormality in fetus (Table – 2).

Table – 2 – Frequency of knowledge distribution among 141 participants who had heard about prenatal screening

	Characteristics	N (%)
Aim of prenatal screening	To identify structural abnormalities in fetus	33 (23.4)
	To identify functional abnormalities in fetus	16 (11.3)

	Both	92 (65.3)
Time at which prenatal screening is done	Early pregnancy	81 (57.4)
	Mid pregnancy	56 (39.8)
	Late pregnancy	4 (2.8)
Diseases that can be identified by prenatal screening	Downs syndrome	135 (95.8)
	Neural tube defects	3 (2.1)
	Congenital abnormalities	3 (2.1)

Prenatal screening is done in early pregnancy, before 20 weeks of gestation. Although 46% of the participants was aware about this, many (32%) believed that such screening tests are done only in mid pregnancy (Table – 2).

Downs syndrome, neural tube defects and other congenital anomalies can be identified by prenatal screening tests. However, majority of the respondents, 135 (77.1%), thought that only Downs syndrome could be identified by such screening practices (Table – 2).

Most of the participants (93.7%) knew that ultrasonography is a screening tool in prenatal screening tests and believed it to be a painless procedure. Around 40.5% of the study population were aware of Nuchal Translucency scan and its use.

The study revealed that 157 (89.7%) of the respondents were aware of Downs syndrome. Among those aware, 89.7% knew that Downs syndrome was a genetic disorder due to an extra chromosome 21. Increased maternal age is a risk factor for development of Downs syndrome. A total of 126 (72%) participants knew the same. However, among the remaining 49 participants, 39.4% and 60% believe increased paternal age and drug consumption during pregnancy to be the major cause for development of Downs syndrome respectively.

PCPNDT Act or Pre Conception and Pre Natal Diagnostic Technique Act 1994, intends to prohibit prenatal diagnostic techniques for sex determination on fetus and thereby preventing female foeticide. Only 52 (29.7%) participants were aware of this act and knew its expansion and importance. It indicates how little people know about the legal implications of prenatal screening practices.

Overall knowledge on prenatal screening and Downs syndrome was assessed based on the questionnaire and was scored on a scale from 0 to 15. Score above 12 indicated good knowledge, between 8 to 12 indicated average knowledge and that below 8 indicated poor knowledge. We found that 57.8% had good knowledge (Table – 3).

Table – 3 - Overall knowledge on prenatal screening and Downs syndrome

Score	Number (%)
<8	0
8-12	74 (42.4%)
>12	101 (57.8%)

Discussion

This study aimed at assessing the knowledge and attitude towards prenatal screening for Downs syndrome and other congenital anomalies, revealed a good level of knowledge on prenatal screening practices among educated women of reproductive age group. However, we found no association between level of knowledge and age of participants. This was similar to what was observed in other studies where they found that it was higher education and not age of the respondent that was an important factor that contributed to better level of knowledge on prenatal screening practices (Binjahalan et al. 2016, Salvi 2020).

Prenatal screening or antenatal screening for congenital anomalies including Downs syndrome is done all over the world. It has become a well-established practice worldwide. Antenatal assessment is usually done during early pregnancy (first trimester). In this study, 57.6% of the participants knew when antenatal screening should be done. This was similar to the study conducted in Sharjah, where 59% of the women were aware that screening should be done in first trimester (Salvi 2020). As a large percentage of the participants were not aware of the time of screening, it is important to educate all women in the reproductive age group especially when they come for their first antenatal

checkup. In our study, 89% of the study population had heard about Down's syndrome. This was much higher compared to what was observed on Down's syndrome screening in Manipal, India, where only 58.4% had heard about it (Nambiar et al. 2018).

Older maternal age is considered to be a risk factor for development for Down's syndrome. While 72% believed increased maternal age to be a risk factor, 16% thought consumption of drugs during pregnancy led to the development of Down's syndrome. This was slightly different from what was observed in Sharjah, where 92% gave increased maternal age to be the risk factor for development of Down's syndrome (Salvi 2020). However, Levis reported that in his study population, there was a significant number of persons who thought that increased maternal age as well as substance abuse during pregnancy were risk factors for developing Down's syndrome (Levis DM et al. 2012).

Ultrasonography is the most common non-invasive tool used in prenatal screening practices. It is done to identify congenital anomalies and abnormal development in fetus during early weeks of gestation. Various other diagnostic tests are available for confirming the presence of any congenital anomaly in fetus. Amniocentesis or chorionic villous sampling and karyotyping can be done to diagnose Down's syndrome. Nuchal Translucency scan (NT scan) is an ultrasound scan undergone by all pregnant women around 12 weeks of pregnancy. It is a screening test to determine Down's syndrome. It alone detects 62% of all Down's syndrome (Muller et al. 2003). We found that 40.5% of the participants knew about NT scan and its significance. This awareness was almost similar to what was seen in a survey conducted among Turkish women to assess the awareness, use and attitude towards Down's syndrome screening (Yanikkerem et al. 2013). They noted that those women who were less educated, unemployed, those who had a patriarchal family type, had lower earnings, those who were unmarried or had consanguineous marriage and did not have a private doctor were less aware of NT scan.

Majority of the women, 76.5%, showed a positive attitude towards screening practices. This was similar to Pruksanusak's observation on Down's syndrome screening among pregnant Thai women, where 77.6% had a positive attitude towards Down's syndrome screening (Pruksanusak et al. 2009). In Salvi MB's study, participants having higher knowledge level regarding screening tests were associated with positive attitude towards screening practices (Salvi 2020). Hence it is important to increase the knowledge regarding antenatal screening for congenital anomalies among all women in the reproductive age group.

This study was conducted among an educated population in an urban setting. In spite of good education, a total of 20% of the study population have not heard about prenatal screening and Down's syndrome. In a country like India, where majority of the people belong to the rural setting and are less educated, it is necessary to make them aware about prenatal screening and its importance.

Conclusion

From the study, it was analysed that a good proportion of women were aware of prenatal screening and its use. Most of them had heard about Down's syndrome and knew what it was. Higher educational qualification has contributed to better understanding on the importance of prenatal screening. However, a small population of women still remain unaware about prenatal screening practices. Some women are not sure about the importance and necessity of prenatal screening. Though many women have a positive attitude towards screening practices, more encouragement is needed to increase it. Women of reproductive age group should be made aware the importance of prenatal screening practices and the right time at which screening should be done.

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