Knowledge and Attitude about Stem Cells among Pregnant Mothers of Srinagar, India

Saima Sultan[1]

ABSTRACT

Introduction: Stem Cells are very unique cells and have been isolated from the dental pulp, exfoliated deciduous teeth, the periodontal ligament, the dental follicle and the dental papilla. Adult dental stem cells can differentiate into many dental components, such as dentin, periodontal ligament, cement and dental pulp tissue, but not into enamel. Hence, this study was conducted to assess the knowledge and attitude about stem cells and dental stem cells among expectant mothers in Srinagar city.

Material and methods: A cross sectional questionnaire based study was carried out among pregnant women attending various Gynecological clinics of Srinagar city for a period of three months regarding Knowledge And Attitude About Stem Cells.

Results: This study included 600 participants. Out of which 80 subjects had never heard about the term stem cells and rest 520 participated and had some percentage of Knowledge About Stem Cells.

Conclusion: Our results showed lack of knowledge about beneficial use of stem cell therapy among pregnant women of Srinagar city.

Keywords: Knowledge, Attitude, Stem Cells, Pregnant Mothers

INTRODUCTION

Stem cells that have attained a large focus of attention in today's regenerative medicine are defined as clonogenic unspecialized cells that can generate into one or more specialized cell types[1]. Stem Cells are very unique cells that have the potential to repair and regenerate into several distinct cell types in the body like tooth, bone, cartilages, skin, adipose tissues, and glands. On the basis of cell maturity, they may be (a) Embryonic Stem Cells (b) Adult Stem Cells. Embryonic stem cells are pluripotent stem cells derived from the inner cell mass of the blastocyst, an early stage embryo. Adult stem cells are undifferentiated cells, found throughout the body after embryonic development, that multiply by cell division to replenish dying cells and regenerate damaged tissues. Also known as somatic stem cells.[2]

Human stem cells have been isolated from the dental pulp, exfoliated deciduous teeth, the periodontal ligament, the dental follicle and the dental papilla. Adult dental stem cells can differentiate into many dental components, such as dentin, periodontal ligament, cement and dental pulp tissue, but not into enamel.[3]

In 2003, Dr. Songtao Shi, announced the discovery of Dental Pulp Stem Cells (DPSCs). Kerkis in 2006 discovered Immature DPSCs,"a pluripotent sub-population of DPSCs" using dental pulp organ culture. The first animal study on bone regeneration and dental use was done in 2007 using DPSC.[4] An amazing property of DPSCs is their ability to regenerate a dentin, pulp like complex arrangement similar to the dentin pulp complex found in normal human teeth.[5] This has given rise to increasing popularity of tooth banking and harvesting of DSCs. Although tooth banking is currently not very popular the trend is gaining acceptance mainly in the developed countries. Lifecell is India's first and largest stem cell bank established in 2004, in Chennai. However, the knowledge and awareness about stem cells seems to be poor among Indians.[6,7] Hence, this study was conducted to assess the knowledge and attitude about stem cells and dental stem cells among expectant mothers in Srinagar city.

MATERIAL AND METHODS

A cross sectional questionnaire based study was carried out among pregnant women attending various Gynecological clinics of Srinagar city for a period of three months. Inclusion criteria included women who were willing to participate in the study and then a written consent was taken from them. A structured questionnaire with a set of 11 questions was designed to evaluate the knowledge, attitude and awareness among pregnant women regarding stem cells and their use. The questionnaire was pre tested amongst 10 pregnant women to confirm its validity and reliability and to avoid ambiguity. Following the pretest, some modifications in the order of questions and terminologies were made in the final questionnaire. A sample size of 600 was calculated and questionnaire was designed in such a way that the procedure should not take more than 10 minutes per subject. The questionnaire comprised of two sections, Section-I included question number 1 which was regarding subjects knowledge about stem cells.

Section-II included 10 items related to stem cells; those who responded positively for the first question in section I were further taken into the study. Descriptive analysis of the Data was performed to get the frequency of responses.

Questionnaire

Section 1:

1. Have You Any Idea Of What Stem Cells Are? Y/N

[1]MDs, Department of Pedodontics and Preventive Dentistry, Kothiwal Dental College and Research Centre, Moradabad, India

Corresponding author: Dr Saima Sultan, Kothiwal Dental College and Research Centre, India

How to cite this article: Saima Sultan. Knowledge and attitude about stem cells among pregnant mothers of Srinagar, India. International Journal of Contemporary Medical Research 2017;4(12):21-24.

	Section Ii: Questions (520 Participants Of Section Ii)	Yes (N%)	No (N%)
1.	Are you aware that stem cells are very beneficial?	276(53.7%)	244(46.9%)
2.	Have you heard of dental stem cells?	190(36.5%)	330(63.4%)
3.	Do you know that stem cells from dental tissues are used to treat many diseases?	150(28.8%)	370(71.1%)
4.	Do you think that the tooth if lost can be regenerated using stem cells?	205(39.4%)	315(60.5%)
5.	Do you know umbilical cord can also be source of stem cell collection?	219(42.1%)	301(57.8%)
7	Would you like to donate umbilical cord during delivery?	278(53.4%)	242(46.5%)
8	Do you know the nearby place where you have the stem cells banking facility available?	166(31.9%)	354(68.7%)
9	Do you think the procedure of collecting stem cells is invasive?	290(55.7%)	230(44.2%)
10	Would you like to have more information on stem cell banking?	406(78.7%)	114(21.9%)

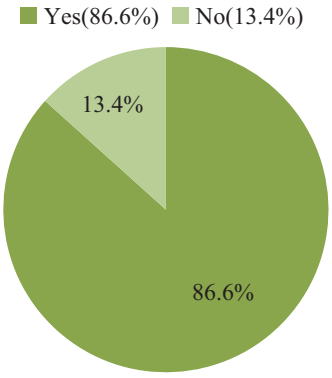

Figure-1: Section I: Overall Participants Knowledge About Stem Cells(Q1)

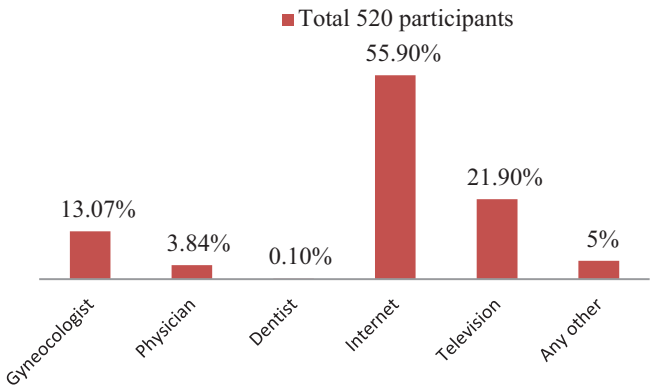

Figure-2: Section II: Responses to Question 07

Section 2:

1. Are You Aware That Stem Cells Are Very Beneficial? Y/N
2. Have You Heard Of Dental Stem Cells? Y/N
3. Do You Know That Stem Cells From Dental Tissues Are Used To Treat Many Diseases? Y/N
4. Do You Think That The Tooth If Lost Can Be Regenerated Using Stem Cells? Y/N
5. Do You Know Umbilical Cord Can Also Be Source Of Stem Cell Collection? Y/N
6. Source Of Information Regarding Stem Cell?
   a. Gyneocologist
   b. Physician
   c. Dentist
   d. Internet
   e. Television
   f. Any Other
7. Would You Like To Donate Umbilical Cord During Delivery? Y/N
8. Do You Know The Nearby Place Where You Have The Stem Cells Banking Facility Available? Y/N
9. Do You Think The Procedure Of Collecting Stem Cells Is Invasive? Y/N
10. Would You Like To Have More Information On Stem Cell Banking? Y/N

RESULTS

This study included 600 participants. Out of which 80 subjects had never heard about the term stem cells as shown in figure 1. Hence were not further questioned. The remaining 520 respondents who had heard and had some knowledge about stem cells were considered for further survey and were questioned further.

Out of 520 subjects 53.7% were aware of the beneficial use of stem cells and 46.9% had heard about stem cells but were not aware of its use. Only 36.5% of pregnant mothers had heard of Dental Stem Cells whereas the majority 63.4% had never heard about them. Only 28.8% participants believed that dental stem cell transplant can be a therapy for majority of chronic illnesses and diseases. Poor knowledge was reported among 39.4% regarding regeneration of tooth, if lost, using stem cells. The respondents were also assessed for their knowledge regarding the source and timing of stem cell collection from umbilical cord. There was a noticeable improvement in the level of knowledge since 42.1% of the participants knew that umbilical cord can also be source of stem cell collection. 53.4% of the subjects had a positive attitude towards donating umbilical cord during delivery whereas 46.5% were still indecisive for the same.

The source of information regarding stem cells as shown in graph for section II, was found to be through internet (55.9%), television (21.9%) gyneocologists (13.07%), physician (3.8%) Dentist (0.10%), any other (5%) as shown in figure 2.

Awareness about dental stem cell banking was found among 31.9% of the subjects. Majority 68.7% did not know the nearby place where stem cell banking was available.

Majority of the expected mothers 55.7% considered procedure of collecting stem cells to be an invasive procedure.

When the participants were enquired if they would want more information regarding stem banking, majority (78.7%)

showed a positive attitude.

DISCUSSION

Stem cells have proved themselves to be of unique type of cells having specialized capacity to differentiate into variety of cells e.g smooth muscle cells, adipocytes, chondrocytes and neurons. Bone marrow, neural tissue, skin, retina, deciduous teeth which exfoliates exfoliate and wisdom teeth can be a potential source for stem cells.[8,9,10]

Umbilical cord blood at the time of delivery is a rich source of stem cells and it is the best gift parents can offer to their children.[11] Hence, this study was conducted to assess the knowledge and attitude knowledge regarding stem cells and dental stem cells among pregnant mothers.

In our study, awareness about the Beneficial use of stem cells was found to be 53.7% which was in contrast to the study done by Saran et al in which 93.9% of the subjects had a clear knowledge that stem cells are beneficial for health.[12] However, the awareness of Dental stem cells was found to be lesser in our study population (36.5%). The clinical benefits of dental SCs are not limited to dental use but can also be used for treating many diseases like myocardial infarction[13], liver dysfunction,[14] diabetes mellitus.[15] Only 28.8% participants believed that dental stem cell transplant can be a therapy for majority of chronic illnesses and diseases.

The unique concept of dental stem cell banking was brought by stemade into Indian terrain. Established in 2009 and launched commercial operations in 2010. Dental stem cells/ mesenchymal stem cells are harvested from the milk teeth of children in the age group of 6-12 years and are stored for 21 years.

Our study showed only 39.4% of the subjects knew that the tooth lost can be regenerated using stem cells. It reflects poor degree of awareness and knowledge of subjects about Dental Pulp Stem cells.

Many Indian celebrities like Ashwariya Rai, Hrithik Roshan have been increasing awareness among Indian customers about umbilical cord stem cell banking which has helped companies like life Cell to push up more than 5000 units a month. There was a noticeable improvement in the level of knowledge in our study since 42.1% of the participants knew that umbilical cord can also be source of stem cell collection. 53.4% of the subjects had a positive attitude towards donating umbilical cord during delivery whereas 46.5% showed negative approach for the same. Only 31.9% of the subjects were aware about nearby place where stem cells banking facility is available. 55.7% of the pregnant mothers considered procedure of collecting stem cells to be an invasive procedure. Our result is similar to a study done by Poomalar GK et al[16] in which 45% percent of pregnant women had knowledge about uses of umbilical cord blood storage.

In a study by Pandey D et al[17]. Only 15% of the women showed willingness for Cord Blood banking at the time of their delivery. Another 13.4% of women were interested, but needed further details on the process before deciding. Hence, obstetricians and paediatricians play an important role in increasing awareness among would be parents regarding umbilical blood cord donation and help them in taking right decision at the right time.[17,18]

In this study the source of information regarding stem cells was found to be through internet (55.9%), followed by television (21.9%) gyneocologists (13.07%), physician (3.8%), dentist (0.10%) any remaining 5% received information through friends and relatives. The general population is becoming increasingly aware about Stem Cells through media such as advertisements and news. However awareness regarding importance of dental stem cells has to be increased. This can be done by dental professionals. In a study by Farhin Katge et al [19] the awareness of stem cells in dentists was 79.4% in graduates, 95.1% in postgraduates, and 78.6% in PhD participants. However, the awareness of Dental Stem Cells was lesser among the same. Hence, Awareness and knowledge among dentists regarding sources, applications, and uses of Dental stem cells should be increased in colleges, conferences and CDE programmes.

In this study 78.7% of the participants showed a positive attitude toward updating their knowledge regarding stem cell banking.

It is important that the health professionals update themselves with knowledge regarding stem cells and Dental Stem Cells for the benefit of a larger population. Stem cell therapy is an emerging therapeutic modality and is believed to be one of the greatest untapped resources currently available for the prevention and treatment of many diseases. Hence, a common man can be educated and motivated to store their children stem cell without any second thought.

According to a recently published study, providing basic information to expecting parents makes them more prone to deciding whether or not to donate Umbilical cord blood.[20] Counselling should be continued as a part of education on stem cells and cord blood banking.

CONCLUSION

Our results illustrates a gap in parental education as Knowledge about beneficial use of stem cell therapy was found be lacking among pregnant women. Especially majority of them are unaware of the use of dental stem cells. Stem cell transplant is the only chance of a cure for many diseases in young children and adults. Only few people knew that deciduous tooth is a good source of stem cells and can be used for tissue regeneration. A positive attitude towards updating the knowledge regarding Dental Stem Cells has been displayed by the subjects. Obstetricians and dental professionals should play a more active role in explaining the patients regarding pros and cons of stem cell banking.

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Source of Support: Nil; **Conflict of Interest:** None

Submitted: 07-12-2017; **Accepted:** 02-01-2018; **Published:** 11-01-2018