

SHORT ARTICLE

Awareness and Attitude of Physicians in Academia towards Human Stem Cell Research (HSCR) and Related Policies in Rajasthan, IndiaNitin K Joshi¹, Latika Nath¹, Vibha Joshi², Anil Purohit¹¹Jodhpur School of Public Health, ²Department of Public Health, Lachoo Memorial College, Jodhpur, Rajasthan.

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Abstract

Introduction: In India, several science agencies are promoting Stem Cell Research (SCR). There is paucity of studies which document the perception of doctors about SCR, especially physicians in academia. This study was carried out to assess perception of physicians in academia towards Human Stem Cell Research (HSCR) and related policies in India. **Methods:** We interviewed 200 doctors from three different government medical colleges of Rajasthan. A semi-structured questionnaire was used to discern their awareness, attitudes towards utilization of SCR and their knowledge of related international and ethical policy issues. **Results:** Though mostly 177 (96.2%) physicians acknowledged the public health benefits of promoting stem cell research in India, but 166 (66.2%) were not aware of the stem cell research policy of the Government of India and 111 (60.3%) were not aware of the ICMR guidelines for Human Stem Cell Research in India. There was a strong desire among academic physicians 152 (82.6%) to incorporate a course on SCR to the students in the near future. **Discussion:** Physicians in academia have views that SCR should be encouraged to treat clinical diseases and this technology should be brought into India in a big way. They seem to believe that one of the ways to promote the benefits of SCR would be to raise awareness by publishing success stories in widely read Indian Medical Journals, giving updated information regarding its uses in clinical practices and its inclusion as a part of the curricula for health professionals.

Key Words

Stem cell; Academicians; Knowledge

Introduction

Stem cells are primal cells common to all multi cellular organisms that retain the ability to renew themselves through cell division and can be differentiated into a wide range of specialized cell types, (1). These cells migrate to injured areas within the body and get transplanted and transform themselves into new tissue cells that replace the damaged ones. Stem cells have the capacity to multiply and renew themselves almost indefinitely (2). They can form nerve cells, muscle cells and blood cells, which cannot multiply by themselves and have limited life spans (3). Stem cell therapy is the use of stem cells to treat or prevent a disease or condition.

Bone marrow transplant is the most widely used stem cell therapy, but some therapies derived from umbilical cord blood are also in use. Research is underway to develop various sources for stem cells, and to apply stem cell treatments for neurodegenerative diseases, diabetes, heart disease, and other conditions, (1).

Stem cell research holds great promise for improving human health by restoring cellular and organ functions, damaged by degeneration and injuries. At the same time, it also raises several scientific, ethical and social issues in the development of such applications, (4). Over the past few years, human stem cell research (SCR) has emerged as a new and

exciting field in the life sciences while also being novel in its potential for clinical applications.

With the ability of scientists to isolate and culture embryonic stem cells, and with scientists' growing ability to create stem cells using somatic cell nuclear transfer and techniques to create induced pluripotent stem cells, controversy has crept in, both related to abortion politics and to human cloning. Stem cell therapy is helpful to treat many blood disorder such as thalassemia, sickle cell anemia, leukemia, aplastic anemia and other organ related disorder such as muscular dystrophy, spinal cord injury, diabetes, chronic kidney disease (CKD), cerebral palsy, autism, optic nerve atrophy, retinitis pigmentosa, lung (COPD) disease and liver cirrhosis, (5). Additionally, efforts to market treatments based on transplant of stored umbilical cord blood have proven controversial (6). Stem cells will completely alter the way we practice medicine.

In India, several science agencies of the government are promoting SCR, (7). However, medical professionals have incomplete knowledge of this. There are very few studies, which have documented the perception of doctors specially physicians in academia. Main role of doctors in academics is to train and mentor resident medical students and new doctors. They also translate latest research in the field of medical biology for clinical use.

Aims & Objectives

To assess the knowledge and perception of such physicians towards human Stem Cell Research (HSCR) and policy in India.

Material and Methods

We interviewed 200 doctors in academic positions of various grades from three different government medical colleges of Rajasthan in 2014. A pre tested semi-structured questionnaire was used after getting approval of the Institutional Ethical committee to discern their awareness, attitudes towards utilization of SCR and their knowledge of related international and ethical policy issues.

Results

The respondents were mostly male (71%), less than 45 years of age (63%) and were specialists (66%) in clinical and non-clinical branches (Table 1).

Though mostly 177 (96.2%) physicians acknowledged the public health benefits of promoting Stem Cell Research in India, but 166 (66.2%) were not aware of the stem cell research

policy of the Government of India and 111 (60.3%) were not aware of the ICMR guidelines for Human Stem Cell Research in India.

More than 80% of the participants felt that stem cell use should be included in the current undergraduate curriculum and that Indian doctors are totally competent in using this technology for clinical conditions (Figure1). However, only 45% of the respondents felt that harvesting a fertilized egg for human cloning is ethical. Less than 60% of the doctors were of the opinion that human cloning is dangerous.

When asked about what practices in HSCR are unethical only 47% responded that harvesting from human embryo is unethical, 57% felt human cloning and 65% felt stem cells from abortus is unethical (Figure 2). There was a strong desire among academic physicians 152 (82.6%) to teach a course on Stem Cell research to the students in the near future and majority of them 150 (81.5%) felt that it is worth spending public funds on Stem Cell research in India. Among the health professionals interviewed 77% knew of the role of stem cell therapy in non-communicable diseases like diabetes and 72% in cardiac failure but only 55% and 30% were aware of the role of this technology in HIV and Kala Azar respectively (Figure 3). Also, 189 (96%) of them felt the need to develop a training program for students and scientists who would contribute to the manpower required for this field in the country.

Discussion

It was found that many physicians in academia have views that stem cell research should be encouraged to treat clinical diseases and this technology should be brought to India in a big way. The utilization of treatments was found more in favour of chronic ailments than infectious disease. It was felt that the scientific faculty involved in basic research on utilization of HSCR in treatments will have translational potential, mostly with adult stem cells at present.

In fact, India is formulating plans for a national stem cell initiative to boost clinical applications of stem cell research, develop linkages between publicly and privately-funded research groups, enable sharing of facilities, ideas, and research and business opportunities, promote interactions between researchers and clinicians and prioritize areas for research funding. The proposal, being drafted by the Indian Council of Medical Research and the

Department of Biotechnology, includes creating a fund to boost stem cell research.

More than 15 labs in the country are engaged in stem cell research, (8), focusing mostly on clinical applications of stem cells in ophthalmology, cardiology and spinal cord repair. Indian researchers have pioneered a stem cell injection for reviving heart muscles (9) and are now planning to use stem cells derived from bone marrow to treat chronic liver failure and to regenerate tissue to treat heart disease, traumatic brain injury and Crohn's disease. Indian doctors have also successfully treated blindness using stem cells derived from the eye. In Lifeline Hospitals, Chennai, they are offering Adult Stem cell therapy for Spinal Injuries, advanced heart disease, liver cirrhosis and cancer, (10). Life Cell, a service provided by Asia Cryo-Cell Pvt Ltd, pioneers in cord blood stem cell banking in India, and Sri Ramachandra Medical College and Research Institute (SRMC & RI), a deemed University and an autonomous body, announced in Chennai their joint venture to set up India's first exclusive stem cell transplant centre, (11).

There was an expressed need for more clarity in ethics and policy issues of stem cell use and that it is time that these should be revised. The two major funding agencies of Government of India e.g. Department of Biotechnology (DBT) and Indian Council of Medical Research (ICMR), have jointly formulated the "Guidelines for Stem Cell Research and Therapy" in 2012, which requires updation and revision. Based on the review of the current world scenario of Cell Based Therapy CBT research and development, suggestions have been made for the development of a new CBT policy that will help in progress of research and patient treatment in India. Additionally, stem cell tourism in Russia and India has raised several scientific/medical, ethical, and policy issues by the provision of unproven stem cell-based treatments within these countries, (12). Hence, in order to establish a clear distinction between treatments based on proven clinical research and "innovative treatment", regulatory measures need to be developed and or strengthened in accordance with internationally accepted standards in such countries to protect those seeking stem cell treatments.

Conclusion

The medical fraternity seems to believe that one of the ways to promote the benefits of stem cell

research would be to raise awareness by publishing the success stories in Indian journals, giving information regarding its uses in clinical practices. There is a consensus among health professionals that it should be part of the curricula for medical, dental and paramedical graduates, as health professionals in their academic career are responsible for developing and evaluating training programs, designing curricula and assessing resident doctors, researching and implementing innovations in the medical field and dealing with policy and accreditation issues. Institutions involved in stem cell research should be properly accredited and their research results verified. Vigilance should be exercised by the medical department on the haphazard commercialization of this avenue.

Authors Contribution

NKJ & VJ: Study conception and design, data collection and analysis, LN: drafting of article manuscript, AP: Final approval of manuscript.

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Tables

TABLE 1 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF HEALTH PROFESSIONALS INTERVIEWED (N=200).

Characteristic	Category	Number(n)	%
Age	<45 yrs	126	63
	>45yrs	54	27
Gender	Male	142	71
	Female	58	29
Education	MBBS	48	24
	MD	130	66
	PhD	6	3
	Others	12	7
Grade	Demonstrator	86	44
	Assistant Professor	12	7
	Associate Professor	36	19
	Reader	46	23
	Professor	14	7
Specializations	Medical	78	39
	Surgical	60	30
	Dental	6	3
	Pre/para Medical	44	22
	Public health	16	8

Figures

FIGURE 1 PERCENTAGE OF AFFIRMATIVE RESPONSES ON KEY ETHICAL CONSIDERATIONS AMONG HEALTH PROFESSIONALS.

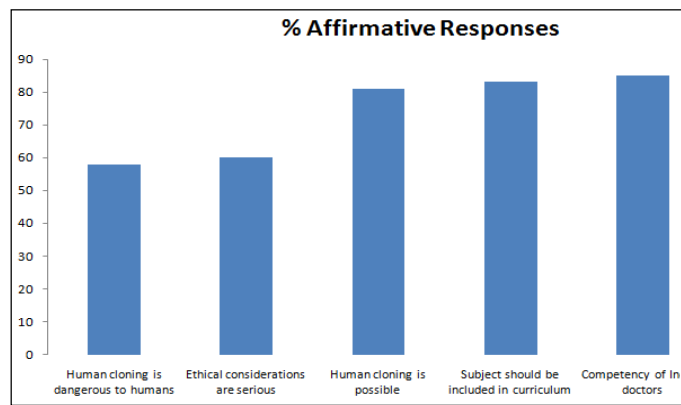


FIGURE 2 CONCERNS ABOUT STEM CELL RESEARCH AMONG HEALTH PROFESSIONALS

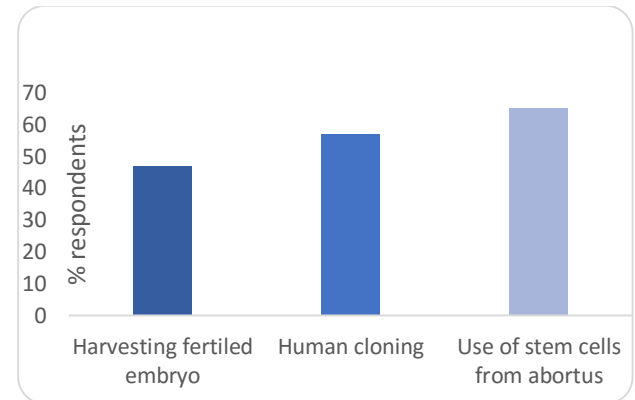


FIGURE 3 AWARENESS OF HUMAN STEM CELL RESEARCH IN VARIOUS DISEASES AMONG HEALTH PROFESSIONALS

