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A Study on Awareness about Cord Blood Banking in Vidarbha Region

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ABSTRACT

Medical science technology has transformed into a greater pinnacle and changed the way the diseases are diagnosed and treated. Recently with the innovation in the marketing strategies with respect to cord blood banking resulted into increasingly used this service to improve and save lives. As this industry is at an emerging stage in India and with considering the future growth perspective of this industry the research was conducted in Vidarbha region specifically in Nagpur and Amravati District with the objective to study awareness and perception of parents about the cord blood banking. Primary data were collected through well-structured questionnaire and interview of parents. The finding reveals that percentage awareness among the customers is very less for the concept of cord blood banking in Nagpur and Amravati region. The factors which are affecting to the awareness amongst the customers are the communication gap, education status, socioeconomic status.

1. INTRODUCTION

To understand it better we need to go through with basic of stem cells and cord blood banking.

Umbilical Cord Blood (UCB) is one of the sources of Stem cells. Umbilical cord blood, also known as placental blood, is blood that flows in the Circulation of a developing fetus in the uterus. After the baby's birth, the leftover Blood in the umbilical cord and placenta—which is a rich source of stem Cells—are often discarded as biologic waste.

Stem Cell: Stem cells are master cells, having the capacity to multiply and give rise to more than 200 cell types which go on to constitute different types of organs like heart, kidney, liver, and other organs.

Stem cell preservation consists of collecting the aforementioned "leftover" Umbilical cord blood from the placenta and umbilical cord after the baby is delivered and the cord is cut—which poses no risk to either the newborn or the mother. This blood containing the stem cells is then sent to the "bank" which processes the sample and ultimately preserves the cells by freezing them with liquid nitrogen.

Sources of Stem Cells:

1. Embryonic Stem Cells:
2. Adult Bone Marrow
3. Menstruation blood (under research)
4. Dental (Banking Started recently)
5. Foetal (Umbilical Cord Blood): There are pluripotent cells containing both epithelial as well as mesenchymal cells.

2. Commercialization of Cord Blood Banking Sector

Stem cell research offers immense potential for revolutionary advances in clinical therapy to provide possible therapeutic solutions for complex and debilitating diseases such as Parkinson's, spinal injury etc. Umbilical cord blood is the rich source of stem cells, which can be preserved cryogenically for years. In future, if a person suffers from life-threatening diseases such as leukemia or other genetic disorders, his stored cells can be used to provide a potential cure. Use

of ones own cells minimize the possibility of cell rejection by body immune system. Stem cell storage offers once in a lifetime opportunity to prospective parents for storing infants cells that can be utilized to treat the child or its near siblings in future.

To collect and preserve this blood, specialized cord blood/ stem cells banks are being established across the world. These banks are large scale cryogenic facility that preserves cord blood at around -196 ºC.

First stem cell bank was established at the National Institute of Biological standards (NIBSC) in the UK in January 2003.Subsequently, stem cell banks became operational in several countries. Stem cell banks are well developed business concept in developed nations and it is rapidly gaining ground in India. At present across the globe, approximately 100 cord blood banks are working. Europe has at least 40% of them, USA and Canada account for around 30% Asia accommodates 20% and Australia is having 10% of the total while AFRICA is yet to open a cord blood bank. In India, 8 companies are working in this sector. (As per RTI Information).

In India, there are approximately 72000 births daily, which results in discarding 72000 umbilical cords a day. This indicates potential of Indian market. Initially, companies were working with the gynecologist to percolate this concept and targeting to premium segment of society only. Lack of success stories in Indian context and cost of preservation is measure challenge for companies to promote this concept. Currently, Lifecell International has adopted new strategies this year they have started mass promotion through print media and digital media. Aishwarya Rai Bachchan is brand ambassador of Lifecell.

3. Importance of the Study

The study reveals the awareness level, perception of parents towards cord blood banking which will help to identify solutions to the challenges which are generally faced by the cord blood company in promotion of their services.

Research Objectives

- ✓ To study awareness and perception of expected parents about cord blood banking.
- ✓ To propose different ways to make UCB banking affordable and accessible to common man.

4. Research Methodology

The study contains both primary and secondary data. For the purpose of collecting primary data, the respondents such as parents and company representative from Amravati and Nagpur region was selected. The sample size of 100 Parents & 6 Company Representatives was selected and the non-probability convenience sampling technique was used for selection of sample. The research has circulated a closed-ended questionnaire among the samples so as to elicit the information and also used the interview method for the collection of information. Even the secondary data was collected from some of the sources such as journals, books, annual report of the companies, websites and magazines.

Prominent Market Players in Cord Blood Banking

In India majority of companies are working on joint venture with foreign companies as their technology partner. The following table list the companies their partner and other details:

Table No. 1 Cord Blood Banking Companies and their Partners (Source: Secondary data)

Company	Technology Partner	Website	Operation started in India	Remark
Reliance Life Services Pvt. Ltd Mumbai	Reliance Life Sciences	www.relbio.com	2001	-
Cryo Stem Karnataka Banglore	-	www.cryostemcell.in	2003	-
Life cell International Chennai	Cryocell International	www.lifecellinternationalindia .com	2004	Achieved 50,000 collection
Stem One Biologicals Pvt Ltd. Pune	Stem One	www.stemone.in	2005	1500 cord blood
Cryo Bank International, Gurgaon	Cryobank International & RJ Corp	www.cryobanksindia.com	2006	40,000 Collection in India
Cord Life Sciences Private Limited, Kolkata	Cord Life Singapore	www.cordlifeindia.com	2006	-
Baby cell, Mumbai	Sewon Cellon tech	www.babycell.in	2009	-
Stemcyte India Therapeutics pvt.ltd, Ahemdabad (Private & Public banking)	Joint venture of Stemcyte (Inc) USA, Apollo Hospital & Cadilla Enterprise.	www.stemcyteindia.com	2010	-

Table No. 2 EXAMPLES OF MARKET OFFERINGS CRYO BANK

Price	Package Descriptions	CRYO CORD	CRYO CORD EXTRA	CRYO CORD CLASSIC	CRYO CORD SUPERIOR	CRYO CORD PREMIUM	CRYO CORD ULTIMATE
		Cord Blood with Cord Banking	Cord Blood with Cord Banking With One (1) Million Cells	Cord Blood with Cord Banking With 10 Million Cells	Cord Blood with Cord Banking With 50 Million Cells	Cord Blood with Cord Banking With 200 Million Cells.	Cord Blood with Cord Banking With 500 Million Cells, IEM Of the Baby and HLA Typing Included
	Processing Method			SEPAX	SEPAX	SEPAX	SEPAX
Plan 1	One Time Storage Plan						
	Registration charges Rs	5,000	5,000	5,000	5,000	5,000	5,000
	Processing Charges Rs	31,500	43,500	61,500	96,500	181,500	256,500
	Storage for 21 Years Rs	38,500	38,500	38,500	38,500	38,500	38,500
	Total Amount Payable at Reg. Rs	75,000	87,000	105,000	140,000	225,000	300,000
Plan 2	Easy Storage Plan	-	-	-	-	-	-
	Registration charges Rs	5,000	5,000	5,000	-	-	-
	Processing Charges Rs	31,500	43,500	61,500	-	-	-
	Storage for First Year Rs	3,500	3,500	3,500	-	-	-
	Total Amount Payable at Reg. Rs	40,000	52,000	70,000	-	-	-
	Storage for Next 20 Years:				-	-	-
	Payable in 5 yearly installments Rs	8,500 x 5	8,500 x 5	8,500 x 5	-	-	-
	1st Installment starting at the beginning the Next Plan Total Rs	82,500	94,500	112,500	-	-	-
Plan 3	Flexi Storage Plan				-	-	-
	25 EMI PLAN	3,400 X 25	3,950 X 25	4,800 X 25	-	-	-
	Registration Charges Rs.	5,000	5,000	5,000	-	-	-
	Processing Charges Rs.	31,500	44,750	66,500	-	-	-
	Storage for 21 Years Rs.	48,500	49,000	48,500	-	-	-
	Plan Total Rs	85,000	98,750	120,000	-	-	-

Table NO. 7.3 Market Offerings FOR LIFE CELL INTERNATIONAL (Source: Secondary data)

Pricing Plans		Services Offered		
Plan	Plan Composition	Baby Cord	Baby Cord Duo	Protect Baby, Protect Mom
		(In Rs.)	(In Rs.)	(In Rs.)
Annual Storage Plan	Enrollment fee	Rs.5,000	Rs.5,000	Rs.5,000
	Processing fee	Rs.29,000	Rs.39,500	Rs.63,000
	First year storage fee	Rs.2,000	Rs.2,500	Rs.4,000
	Total Initial Payment	Rs.36,000	Rs.47,000	Rs.72,000
	Annual Storage Fee (20 Years)	Rs.2,000	Rs.2,500	Rs.4,000
21 Years Storage Plan		Rs.59,900	Rs.74,900	Rs.1,19,900
	Enrollment, processing and storage fee for 21 years (No annual storage fee)			
Value added service	Optional service which can be combined with any of the above services	-	-	-
Guarantee to expand 500 Million Umbilical cord tissue stem cells obtained from Child to be provided at the time of transplant.	Rs.5,000	-	-	-
Baby Shield - Newborn Screening	Rs.4,990	-	-	-

Description of Services

Baby cord:-Testing, processing and storage of minimally manipulated cord blood stem cells obtained from Child.

BabyCord Duo – Testing, processing and storage of minimally manipulated umbilical cord blood & cord tissue stem cells and not less than 1 Million umbilical cord tissue derived mesenchymal stem cells.

Protect Baby, Protect Mom – Testing, processing and storage of minimally manipulated cord blood & cord tissue stem cells and not less than 1 Million umbilical cord tissue derived mesenchymal stem cells obtained from Child. Testing, processing and storage of minimally manipulated & minimally expanded menstrual blood stem cells obtained from Client. Expansion up to 500 Million menstrual blood derived mesenchymal stem cells to be provided at the time of transplant.

5. Analysis and Interpretation

Null Hypothesis: - There is no association between the education level of the parents and their level of awareness towards stem cell banking.

Alternative Hypothesis: - There is association between the education level of the parents and their level of awareness towards stem cell banking.

Table No. 3 Relationship between Education Level and awareness Level of Consumers (Parents)

Education Level	Awareness towards stem cell banking		
	Yes	**No**	**Total**
Undergraduate	2	4	6
Graduate	35	24	59
Post Graduate	28	7	35
Total	**65**	**35**	**100**

Expected Frequency Table

Observed Frequency	Expected Frequency	(O-E)	Square of (O-E)	Square of (O-E)/E
2	4	-2	4	0.93
4	2	2	4	1.72
35	38	-3	9	0.23
24	20	4	16	0.80
28	23	5	25	1.10
7	12	-5	25	2.04
Total				**6.82**

Chi Square Test = 6.82

Level of Significant = 5

Table Value of Chi Square test = 5.991

Number of Degree of Freedom = 2

Inference

It is established that the calculated value (6.82) is more than the table value (5.991) at the significance of level of 0.5 Hence the null hypothesis is rejected.

Conclusion

As the level of education among the parents and the awareness level are dependent hence there is association between the education level of the parents and their level of awareness towards stem cell banking.

Chi – Square Test

Null Hypothesis: -There is no association between the age of the parents and their perception towards Stem Cell Banking.

Alternative Hypothesis: - There is association between the age of the parents and their perception toward stem cell banking.

Table No.4 Relationship Between Age and Perception of Parents

Chi Square Test				
Observed Frequency	**Expected Frequency**	**(O-E)**	**Square of (O-E)**	**Square of (O-E)/E**
3	2	1	1	1
1	1	0	0	0
3	1	2	4	8
0	0	0	0	0
25	24	1	1	0
15	14	1	1	0
5	6	-1	1	0
3	3	0	0	0
20	19	2	4	0
10	11	-1	1	0
4	5	-1	1	0
3	3	0	0	0
2	6	-4	16	3
4	3	1	1	0
4	1	3	9	6
1	1	0	0	0
Total				**18**

Expected Frequency Table

Age	**Perception of Parents towards Stem Cell Banking**				
	It Has Great Significance	**For Future it is crucial**	**This is just Hype Created by the company**	**It Has Negligible Value**	**Total**
20-25	3	1	0	0	**4**
26-30	25	15	5	3	**48**
31-35	20	10	4	3	**37**
36-40	2	4	4	1	**11**
Total	**50**	**30**	**13**	**7**	**100**

Chi Square Test = 18

Level of Significant = 5

Number of Degree of Freedom = 9

Table Value of Chi Square test = 16.919

Inference

It is established that the calculated value (18) is more than the table value (16.919) at the significance of level of 0.5 Hence the null hypothesis is rejected.

Conclusion

As the calculated value is more than table value so it is concluded that there is association between the age of the respondents and their perceptions towards the stem cell banking.

6. CONCLUSION

✓ It is concluded from the analysis and on the basis of hypothesis testing that the awareness among the parents in Nagpur and Amravati region is less especially in the category where the parents are less educated.

✓ Educated parents those who are aware of the concept of stem cell banking know the Life Cell Companies compared to the other companies like cryobank, cordlife, babycell etc. those who are offering services in this cites.

✓ On the basis of the analysis, it is concluded that age is the major factor which affect the perception of parents towards the stem cell banking. Parents who are in category of 31-40 are more worried about the health diseases and their treatment hence their perception towards the stem cell banking is more positive compared to the other group category.

✓ It is concluded from the analysis that the parents who take initiative regarding getting more enquiry about the stem cell banking and those who asked the doctors regarding this facility the doctor recommend this category of parents and also the doctor proposition to parents depends on the factor like paying capacity of the parents, continuous efforts by the companies to communicate to doctor, approach of the parents, health status of the parents etc.

✓ On the basis of secondary data analysis, it is concluded that umbilical cord is better source for treatment comparatively other source i.e. bone marrow, Embryonic Menstrual blood etc.

✓ Maximum number of doctors from both the city propose parents should opt for stem cell banking with special note they should opt if they can afford it and significant number also against for stem cell banking. Study reveals the reason for opposition, it is not proven up till now and other sources like bone marrow are available for treatment.

7. Suggestion And Recommendations

✓ These services should be available at cost which is affordable to masses.

✓ There should be strict control and regulation on this industry.

✓ More emphasis should be given on implementation part i.e. treatment should be made available at affordable cost.

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