

Effect of Structured Teaching Programme regarding Stem Cells and Umbilical Cord Blood Banking on Knowledge among Antenatal Mothers

P Padmavathi

Stem cells have the ability to build every tissue in the human body; hence, they have great potential for future therapeutic uses in tissue regeneration and repair. All of the blood cells in your body start out as young (immature) cells called hematopoietic stem cells (haematopoietic means blood-forming.) Even though they may be called 'stem cells' for short, these cells are not the same as stem cells from embryos that are studied in cloning and other types of research. Here, we will use 'stem cells' to mean haematopoietic stem cells (Jesse, 2009).

Around 30 percent of unrelated haematopoietic stem cell transplants now come from cord blood. A large number of stem cells are normally found in the blood of newborn babies. After birth, the blood that is left behind in the placenta and umbilical cord (known as cord blood) can be taken and stored for later use in a stem cell transplant.

Umbilical cord stem cell therapy is utilised through the blood of umbilical cord. After the placenta has been expelled from the body after a baby is born. As a rich source of stem cells, many parents today are 'banking' their children's umbilical cord cells in case they are needed for curing disease in the future. Stem cell therapy research utilising umbilical cord blood stem cell therapy is making huge advancements today (Brunstein, 2006).

More than 1,200 placental or cord blood transplantations have been performed till now. Stem cell transplantation (SCT) is a life saving procedure for a number of malignant and non-malignant life threatening diseases. More than 40,000 SCTs are being performed annually worldwide. In India, progress has been slow and the number of transplants performed till now is around 500 (Laughlin, 2006).

The first cord blood bank was established in early 1990s in New York. Subsequently, over 35 cord blood banks have been established in 21 countries. As of today, over 150,000 cord blood units are available. Majority of these have been typed for HLA A,

B and DR; 75 percent have molecular typing for class II and 50 percent have molecular typing for class I. Cord blood banking involves recruitment, consent, testing of maternal donors, collection, processing, cryopreservation, testing and releasing cord blood unit to transplant centre (Barker, 2007).

In 2003, less than 30 diseases were able to get cured or supported with stem cell, but today over 85 diseases can be cured and supported. Cord blood transplants have been in use since 1988, and by the end of 2009 there had been about 20,000 cord blood transplants worldwide. The definitive statistics on the rate of stem cell transplantation in the US were published in a child up to 20 years of age receiving an autologous stem cell transplant to be 1 in 5,000 and increasing to 1 in 450 by age 70 (Nietfeld et al, 2008).

A study was therefore conducted to evaluate the effectiveness of structured teaching programme regarding stem cells and umbilical cord blood banking on knowledge among antenatal mothers at TPN Hospital, Erode (TN).

Objectives

The objectives of the study were :

- To assess the knowledge on stem cells and umbilical cord blood banking before and after structured teaching programme among antenatal mothers.
- To assess the effectiveness of structured teaching programme regarding stem cells and umbilical cord blood banking on knowledge among ante natal mothers.
- To find out the association between post-test knowledge scores on stem cells and umbilical cord blood banking among antenatal mothers with their demographic variables.

Hypotheses

H₁. There is a significant level of knowledge on stem cells and umbilical cord blood banking before and after structured teaching programme among antenatal mothers.

H₂. There is a significant effectiveness of structured

The author is Vice-Principal, Dhanvantri College of Nursing, Ganapathypuram, Thiruchengodu (TK), Namakkal Dist.

teaching programme regarding stem cells and umbilical cord blood banking on knowledge among ante natal mothers.

H₃. There is a significant association between post-test knowledge scores on stem cells and umbilical cord blood banking among antenatal mothers with their demographic variables.

Review of Literature

Conrad Fernandez (2006), conducted a study to examine pregnant women's knowledge regarding cord blood banking. A total of 443 women (68%) responded. More than half of the women (307/438 or 70%); 95% confidence interval [CI] 66% to 74%) reported poor or very poor knowledge about cord blood banking. Many of the respondents (299/441 or 68% 95% [CI] 63% to 72%) thought that physicians should talk to pregnant women about the collection of cord blood, and they wanted to receive information about this topic from health care professionals (290/441 or 66%; 95% [CI] 61% to 70%) or prenatal classes (308/441 or 70%; 95% [CI] 65% to 74%). Most of the women (379/442 or 86%; 95% [CI] 82% to 89%) would elect to store cord blood in a public bank, many citing altruism as the reason for this choice. A much smaller proportion (63/442 or 14%; 95% [CI] 11% to 18%) would elect private banking, indicating that this would be a good investment or that they would feel guilty if the blood had not been stored. Additional acceptable uses for cord blood included research (mentioned by 294/436 women or 67% [95% CI 63% to 72%]) and gene therapy (mentioned by 169/437 women or 39%; 95% [CI] 34% to 43%).

Stephen Ski Hung Suen, (2011), in a study of two major public maternity units in Hong Kong stated that the majority (78.2%) had no idea that there was the chance of using self-stored stem cells. Moreover, most of the respondents were unclear about which diseases other than leukemia are amenable to treatment with UCB stem cells in general. Only 20.3 percent of women knew that stem cells are available from the Red Cross in case their children need haematopoietic cell transplantation.

Fernandez (2011) revealed that 3 percent of patients were extremely knowledgeable, and 74 percent were minimally informed. Only 14 percent of pregnant women stated that they had been educated about umbilical cord blood banking by an obstetrical care provider.

Conrad V Fernandez, et al (2001) found that about 70 percent of the women had poor or no knowledge about cord blood banking.

Dinc & Sahin (2009) also showed that majority of participants had lack of knowledge regarding stem cells and cord blood banking and wanted more information.

A study to assess the effectiveness of self instructional module on the knowledge regarding placental cord blood banking among ante natal mothers in selected hospitals in Kasargoad, by approaching one group pre-test post-test design showed that self instructional module was effective in increasing the knowledge of staff nurses ($t=14.34$). The mean post test knowledge ($x_2=43.17$) was higher than the mean pre-test knowledge ($x_1=30.40$). Also there was no association between the pre-test knowledge scores and the selected demographic variables.

J Sugarman et al (2009) also showed similar results in their study of 30 health professionals.

Methodology

The study involved an experimental evaluative research approach with pre-experimental design (one group pre- and post-only design) with ante natal mothers at TPN Hospital, Erode as target population. Purposive sampling with 30 samples was used. Independent variable was structured teaching programme, and dependent variable was knowledge. Structured interview schedule was used to assess the knowledge, and structured teaching programme on stem cells and umbilical cord blood banking.

Data collection : Pre-test conducted by using Structured interview schedule to assess the knowledge. Immediately after pre-test, structured teaching programme was given to group of ante natal mothers about 25 -30 minutes. After 7 days, post-test was conducted by using same structured interview schedule to assess the knowledge.

Validity and Reliability : Split half method was used to find the reliability of the interview schedule. Test-retest method was used to find out the reliability of the structured teaching programme. Under Descriptive Statistics, Percentage, Mean and Standard Deviation were employed and under Inferential Statistics, 't' test and Chi-square test were used.

Results

Section A : In relation to the socio-demographic variables : Majority (50%) of antenatal mothers were in the age group of 26 - 30 years. Educational status revealed that most (53%) of them had secondary education, 63 percent were housewife, 62 percent were Primigravida, 60 percent of antenatal mothers were in the 34 - 37 gestational weeks and all of them had regular antenatal visits.

In relation to analysis of overall knowledge score

Table 1: Pre- and post-test mean knowledge scores of mothers

Area	Max. Scores	Pre-test			Post-test			Difference in mean %
		Mean	SD	Mean %	Mean	SD	Mean%	
Introduction	4	1.4	0.8	5.8	3.37	1.01	84.25	78.45
Meaning	2	1.1	0.6	4.6	2	0	100	95.4
Uses	2	0.9	0.5	3.8	1.37	0.59	68.5	64.7
Procedure	16	6.8	1.7	28.3	14.7	0.72	91.88	63.58
Total	24	10.2	3.6	42.5	21.87	2.79	91.12	48.62

of structure teaching programme regarding stem cells and umbilical cord blood banking, the data revealed that out of 30 mothers, 56.67 percent of antenatal mothers had poor knowledge, 43.33 of them had average knowledge. In post-test, 70 percent of antenatal mothers had good knowledge and 30 percent had average knowledge.

Area wise mean post-test knowledge score of mothers was found significantly higher (21.87) than their mean pre-test knowledge score (10.2) (Table 1)

The paired 't' test value was (29) = 20.86, $p < 0.05$ level when compared to table value (2.15) it was high. This suggested that the structure teaching programme was effective and it increased the knowledge of ante natal mothers on stem cells and umbilical cord blood banking.

Conclusion

Prior to implementation of structured teaching programme, ante natal mothers had poor knowledge on stem cells and umbilical cord blood banking; its effectiveness was evaluated by post-test scores; the mean knowledge score had improved from 10.2 to 21.87 after implementation of STP, which shows that STP was effective. the study by Yanichin (2002) shows that mothers who underwent teaching programme had highly significant knowledge gain and good practice of breast feeding ($p < 0.01$). Thus, highly signifi-

cant association was found between pre- and post-test knowledge scores. However, no significant association was found between post-test knowledge scores and their demographic variables.

Implications

The findings of the study have implication in Nursing service, Nursing administration and Nursing research.

Nursing service : STP can be used by the Nursing professionals who are working in hospital and clinical settings.

Nursing education : Nurse educator should (i) educate the students and antenatal mothers regarding STP regarding stem cell and its implementation, and (ii) encourage the Nursing personnel to practice the STP on stem cell and umbilical cord blood banking in their clinical settings.

Nursing administration: Nurse administer can support the researcher to conduct the research on various problems faced by the ante natal mothers.

Nursing research: The study may be issued for further reference.

Recommendations

- ♦ The present study can be replicated on a large sample, with a pre-test post-test with control group.
- ♦ A comparative study can be conducted among urban and rural ante natal mothers
- ♦ A similar study can be carried out (a) with a large sample size for wider generalization, (b) among nursing personnel working in different wards, and (c) by using different teaching strategies.

References

1. Helen Varney, Jan MKriebs, Carolyn L Geger. Text books of Obstetrics, 6th edn, 2004; India Publishers and Distributors, India
2. Edge Valerie, Miller Mindi (1999). Womans Health Care, 3rd edn; New Delhi: Mosby Publications (P) Ltd; pp 342-44
3. Fernandez CV, et al. Knowledge and attitudes of pregnant women with regard to collection, testing and banking of cord blood stem cells. *CMAI*. 2011 Mar 18; 168(6): 695-98.
4. Stephen Sik Hung Suen et al. Maternal understanding of commercial cord blood storage for their offspring: A survey among pregnant women in Hong Kong. Vol 90, Issue 9, pp 1005-09, September 2011
5. Conrad V Fernandez, Kevin Gordon, Michiel Van den Hof. Knowledge and Attitudes of Pregnant Women with regard to Collection, Testing and Banking of Cord Blood Stem Cells; 2001
6. Dinc H and Sahin NH. Pregnant women's knowledge and attitudes about stem cells and cord blood banking. *International Nursing Review* 2009 May; 56(2): 250-56.

