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Research Article

Video Assisted Teaching Umbilical Cord Blood Collection

Effectiveness of Video Assisted Teaching On Knowledge Regarding Umbilical Cord Blood Collection for Stem Cell Therapy Among Women Attending an Antenatal Outpatient Clinic in A Selected Hospital in Puducherry, India - A Prospective Homogeneous Quasi-Experimental Trial

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Abstract: Umbilical cord blood was previously considered a waste product. It is now used to treat a variety of diseases. Umbilical cord blood is the blood that remains after childbirth in the placenta and the attached umbilical cord. Cord blood is collected because stem cells found in it can be used to treat hematopoietic and genetic disorders. The study aimed to see how effective video-assisted teaching on cord blood collection for stem cell therapy was among antenatal women. A quasi-experimental (one-group pretest and post-test) research design was adopted for this study. Sixty antenatal women who were attending antenatal OPD were selected by Purposive sampling. The structured questionnaire collected data to assess the level of knowledge regarding umbilical cord sample collection and stem cell therapy. In addition, structured, validated video-assisted teaching was done by experts in the field. The present study depicts that the pre-test means the level of knowledge of 5.48 with an SD of 2.04 was increased to 19.45 with an SD of 1.45 in the post-test after video-assisted teaching. Video-assisted teaching was found to be highly significant at p <0.001. The study concluded that the investigator-designed Video-assisted education effectively improved umbilical cord blood collection knowledge for stem cell therapy among antenatal women. The significant limitation of the study is that it is not double-blinded, as it involves a specific teaching course.

Keywords: Umbilical Cord Blood Collection, Stem Cell Therapy, Antenatal Women, Knowledge, Video-Assisted Teaching.

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1. INTRODUCTION

Cord blood was once thought to be waste. It is now used to treat a wide range of disorders[1]. Nature has endowed the baby with special cells that serve as the foundation for life due to their unique ability to develop into various types of cells, generating different tissues and organs.[2] The remarkable ability of stem cells to heal, repair, replenish, and regenerate is worth knowing .[3] Umbilical cord blood is the blood that remains in the placenta and the associated umbilical cord after childbirth. [4] Cord blood is collected because it contains stem cells that can be used to treat genetic and hematological diseases. [5] The two stem cells most frequently identified while conserving umbilical cord stem cells are hematopoietic stem cells and mesenchymal stem cells. [6] Cord blood stem cell transplants have been successful in patients (mostly children) with specific diseases such as acute lymphatic leukemia, myelodysplastic syndrome, juvenile chronic myelogenous leukemia, acute myelogenous leukemia, chronic lymphocytic leukemia, neuroblastoma, chronic myelogenous leukemia thalassemia, and severe combined immune deficiency.[1,7] When it was discovered in the early 1990s that some cells produce blood cells, the first actual stem cells were discovered. Using umbilical cord blood as a different source of stem cells for transplantation was first proposed in 1983. In 2008, over 12,000 cord blood stem cell transplants were performed worldwide..[8] A study in Calcutta looked at transfusions of placental umbilical cord whole blood. The study included 62 patients beginning at the age of nine, with 32 having various stages and grades of cancer. The remaining 30 patients had thalassemia major, aplastic anemia, systemic lupus erythematosus, chronic renal failure, rheumatoid arthritis, ankylosing spondylitis, and a geriatric group with benign prostatic hypertrophy. After the baby was taken out of the operating room and the mother's health was determined to be stable, 174 units of umbilical cord whole blood were aseptically drawn from the umbilical vein and placed in standard pediatric blood transfusion bags. It was discovered that, in addition to numerous growth factors and other cytokine-rich cord blood, has also benefits n oxygen carriage. [9-11]

1.1 Objectives

To assess the knowledge of umbilical cord blood collection for stem cell therapy among antenatal women.To determine the effectiveness of video-assisted teaching on umbilical cord blood collection for stem cell therapy among antenatal women.To find the association between the level of knowledge and the selected demographic variables of antenatal women.

1.2 Hypotheses

H1 - There is a significant difference between the pretest and post-test levels of knowledge on umbilical cord blood collection for stem cell therapy among antenatal women.
H2 - There is a significant association between antenatal women's knowledge and selected demographic variables.

2. MATERIALS AND METHODS

The study was conducted in a medical teaching institute in a

2.1 Study primer

The City of South India. After informed consent, the mothers were recruited. The study had prior ethical approval from the institutional committee. (KGNC/IHEC/2017/0024) The research was done in accordance with the declaration of Helsinki.

2.2 Sampling- Inclusion and exclusion criteria

The sample was recruited from women attending the antenatal clinic of Mahatma Gandhi Medical college and research institute. The mothers should give valid informed consent. The antenatal mothers with a significant systemic illness and inability to understand the video sessions or on drugs that can affect mentation are excluded.

2.3 Data collection

Sixty antenatal mothers were recruited for the study after scrutinizing the inclusion and exclusion criteria. After noting the primary demographic data, they were subjected to a structured questionnaire, and a composite score out of 25 was recorded. The score is a validated one by experts of our institution. Informed consent from the samples was obtained. The pretest was done using a structured interview method to assess the demographic data. The level of knowledge regarding umbilical cord sample collection and stem cell therapy was also evaluated using a structured questionnaire. After that, Video-assisted teaching on umbilical cord blood collection for stem cell therapy was given to the antenatal women on the same day. The teaching material used was established. The post-test was conducted after six days with the same antenatal women.

2.4 Ethical statement

The study mentioned was conducted with the highest ethical standards and was approved by the institutional ethical committee (KGNC/IHEC/2017/0024). Furthermore, the research team ensured that the study adhered to the principles outlined in the Declaration of Helsinki, a widely recognized ethical guideline for medical research involving human subjects. The declaration of Helsinki lays out guidelines for ethical medical research, including ensuring the safety and well-being of research participants, obtaining informed consent, and avoiding potential harm. By following these guidelines, the study aimed to provide reliable and trustworthy results while ensuring that the rights and dignity of all participants were respected. The study's compliance with ethical standards highlights the commitment of the research team to conducting responsible and ethical research.

3. STATISTICAL ANALYSIS

The data analysis was done using descriptive statistics such as frequency, percentage, mean and standard deviation. In addition, inferential statistics like the Wilcoxon test were used to compare the umbilical cord blood collection and stem cell therapy, and the Mann-Whitney U test was used for non-parametric data. Finally, the Pearson correlation was used to find the association between variables.

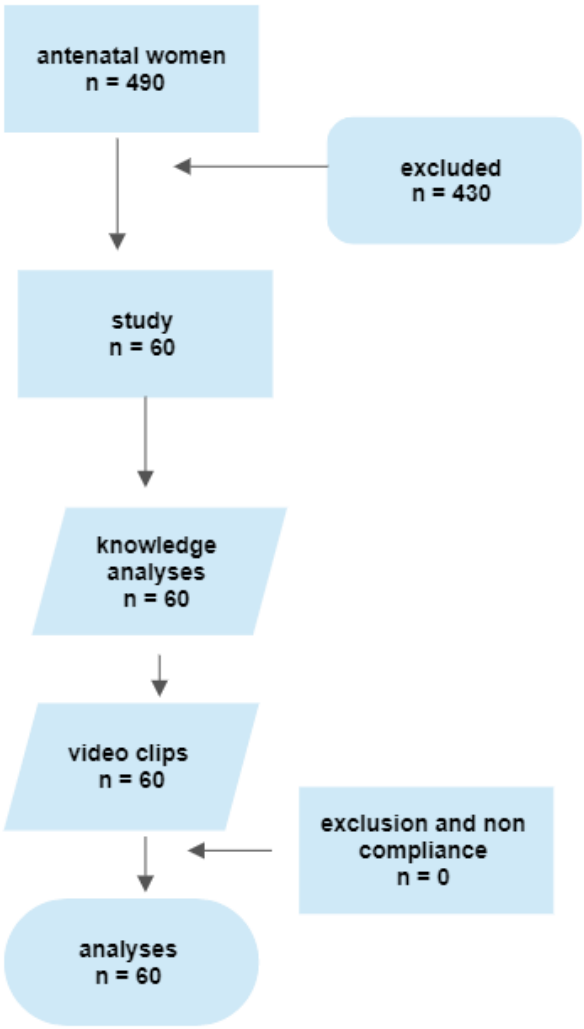

Fig 1: Study Flow chart

4. RESULTS

4.1 Distribution of demographic variables of antenatal women

- Among 60 Antenatal women around, 9 (15%) samples were in the age group of less than 20 years of age, 27 (45%) respondents were in the age group of 20 - 25 years, 18 (30%) were in the age group of 25 - 30 years, 6(10%) were above 30 years of age.
- It was observed that most antenatal women, 41(68.3%), were living in a nuclear family, and only 19(31.7%) were from extended families. Furthermore, out of 60 antenatal mothers, more than half of the respondents, 36(60%), were from an urban area, and 24(40%) were from a rural area.
- It shows that 16(26.7%) respondents were illiterate, 18(30%) were with the educational status of primary school level, 10(16.7%) were completed high school, and an equal number of antenatal women, 8(13.3%) were completed higher secondary school and graduated.
- Among 60 antenatal women 23(38.3%) were having family income Rs. <5,000, 27(45%) were having Rs.5, 000 to 10,000, 6(10%) were having 10,000 to 15,000, 4(6.7%) were having > 15,000.
- It was illustrated that the majority, 33(55%), were house wife, 12(20%) were government employee, 11(18.3%) were working as private sector employees, and only 4(6.7%) antenatal women were daily workers.
- It was observed that the majority of antenatal women, 41(68%), were from the religion of Hinduism, 05(8.3%) were from a Christian family, and 14(23.3%) were from a Muslim family.
- The significant proportion of respondents, 38(63.3%), were Primi gravida women, and the remaining 22(36.7%) were Multi gravida women.

Table 1: Comparison of Mean, Median, and Standard deviation of pretest and post-test scores on umbilical cord blood collection for stem cell therapy.

ASPECTS	MEAN	MEDIAN	STANDARD DEVIATION	WILCOXON TEST	P VALUE
PRE-TEST	5.48	5	2.04	6.752	
POST-TEST	19.45	19	1.45		<0.001*

Table.1. shows that the mean knowledge of 5.48 with an SD of 2.04 in the pretest was increased to 19.45 with an SD of 1.45 in the post-test after video-assisted teaching. Statistically, video-assisted education was highly significant at p <0.001. So Hypothesis H1 was accepted. Regarding association, there was no significant association between the knowledge of antenatal women and the selected demographic variables. So Hypothesis H2 was rejected.

5. DISCUSSION

The first objective of the present study was to assess the knowledge of umbilical cord blood collection for stem cell therapy among antenatal women. In the pretest, 60(100%) respondents needed more knowledge. None of the respondents had moderate and adequate knowledge. This indicates that a video-assisted teaching program is necessary to improve their knowledge of umbilical cord blood collection for stem cell therapy. The second objective was to determine the effectiveness of video-assisted teaching on cord blood collection for stem cell therapy among antenatal women. The mean knowledge score was 5.48 with an SD of 2.04 on the pretest was increased to 19.45 with an SD of 1.45 on the post-test after video-assisted teaching. Statistically, video-assisted teaching was found to be highly significant with the knowledge of antenatal women on umbilical cord blood collection for stem cell therapy at <0.001 level. A study was conducted in Coimbatore to evaluate the effectiveness of a video-assisted teaching program on umbilical cord stem cell collection, preservation, and utilization. Thirty health professionals were involved in the study. The study results showed that the post-test score (mean: 39.6±2.57) was higher than the pre-test (mean: 13.23±3.88). It was concluded that the video-assisted teaching program was effective in enhancing the knowledge of health professionals regarding umbilical cord stem cell collection preservation and utilization.[12] The third objective was to find the association between the level of knowledge and the selected demographic variables of antenatal women. The analysis found showed no significant association between the knowledge of antenatal women. The selected demographic variables such as age in years, educational status, occupation of the mother, family income, religion, family type, area of residence, source of information, gestational age in the week, and gravida were undergone for association with knowledge. Porchelvi et al. [13] have used video-assisted sessions to improve women's knowledge in the self-breast examination. In yet another study[14], it was proposed to include varied interventional training materials on the importance of stem cells in the medical field while considering religious, ethical, cultural, moral, and social aspects. This is necessary given the significance of stem cells in today's medical scenario and the notion that medical and dental students are future healthcare providers. In this context, our study assumes significance. Williams et al. [15] have discovered the need for knowledge of stem cell therapy in individual disorders. The study aimed to assess the effectiveness of video-assisted teaching on knowledge regarding umbilical cord blood collection for stem cell therapy among women attending antenatal outpatient clinics in Puducherry, India. The results showed a significant increase in knowledge scores after video-assisted teaching, highlighting the efficacy of this approach in increasing awareness and understanding of this topic. However, it's important to note that the study was limited to a single hospital and a homogeneous sample, which may limit its generalizability to other populations. Additionally, the study was not double-blinded, meaning there may have been biasing in the results. Further studies with more diverse samples and stronger study designs would be needed to confirm the findings. In conclusion, the study provides valuable insights into the effectiveness of video-assisted teaching to improve umbilical cord blood collection knowledge for stem cell therapy. The results can inform future efforts to educate women on this critical topic, ultimately leading to better patient outcomes.

6. LIMITATIONS

The study is a single centric small sample study. The study could not be blinded due to obvious reasons that a group needed video teaching. Randomized trials for validation should follow the investigation.

7. CONCLUSION

A study was conducted to assess the effectiveness of video-assisted teaching on umbilical cord blood collection for stem cell therapy in 60 antenatal women using a quasi-experimental design. The pre-test means knowledge score was 5.48, which increased to 19.45 after video-assisted teaching, showing a significant improvement (p<0.001). The study concluded that video-assisted education effectively improved umbilical cord blood collection knowledge for stem cell therapy. The study's limitation is its lack of double-blinding. Nevertheless, the study concluded that the investigator-designed Video-assisted teaching effectively improved the ability of umbilical cord blood collection for stem cell therapy among antenatal women.

AA – concept and design, communication and review, UR LS and VP – data collection and manuscript

8. CONFLICT OF INTEREST

Conflict of interest declared none

9. REFERENCES

1. Ballen KK, Gluckman E, Broxmeyer HE. Umbilical cord blood transplantation: the first 25 years and beyond. Blood, The Journal of the American Society of Hematology. 2013 Jul 25;122(4):491-8.
2. Fuchs E, Segre JA. Stem cells: a new lease on life. Cell. 2000 Jan 7;100(1):143-55.
3. Hassan WU, Greiser U, Wang W. Role of adipose-derived stem cells in wound healing. Wound repair and regeneration. 2014 May;22(3):313-25.
4. Moise Jr KJ. Umbilical cord stem cells. Obstetrics & Gynecology. 2005 Dec 1;106(6):1393-407.
5. Ballen KK, Barker JN, Stewart SK, Greene MF, Lane TA. Collection and preservation of cord blood for personal use. Biology of blood and Marrow Transplantation. 2008 Mar 1;14(3):356-63.
6. Friedman R, Betancur M, Boissel L, Tuncer H, Cetrulo C, Klingemann H. Umbilical cord mesenchymal stem cells: adjuvants for human cell transplantation. Biology of Blood and Marrow Transplantation. 2007 Dec 1;13(12):1477-86.
7. Xu F, Taki T, Yang HW, Hanada R, Hongo T, Ohnishi H, Kobayashi M, Bessho F, Yanagisawa M, Hayashi Y. Tandem duplication of the FLT3 gene is found in acute lymphoblastic leukemia as well as acute myeloid leukemia but not in myelodysplastic syndrome or juvenile chronic myelogenous leukemia in children. British journal of hematology. 1999 Apr;105(1):155-62.
8. Potten CS, Loeffler M. Stem cells: attributes, cycles, spirals, pitfalls, and uncertainties. Lessons for and from the crypt. Development. 1990 Dec 1;110(4):1001-20.
9. Bhattacharya N. Placental umbilical cord whole blood transfusion: a safe and genuine blood substitute for patients of the under-resourced world at emergency. Journal of the American College of Surgeons. 2005 Apr 1;200(4):557-63.
10. Bhattacharya N. Placental Umbilical Cord Whole Blood Transfusion: A True Blood Substitute to Combat Anemia in the Background of Chronic Disease–A Study Report (1999–2006). In Frontiers of Cord Blood Science 2009 (pp. 227-263). Springer, London.
11. Monsel A, Zhu YG, Gennai S, Hao Q, Liu J, Lee JW. Cell-based therapy for acute organ injury: preclinical evidence and ongoing clinical trials using mesenchymal stem cells. Anesthesiology. 2014 Nov;121(5):1099-121. doi: 10.1097/ALN.0000000000000446. PMID: 25211170; PMCID: PMC4206665.
12. Sumathy K, Muthulakshmi P. Assessing health professionals' knowledge of Umbilical Cord Stem cell collection, preservation, and Utilization. Nightingale Nursing Times 2010; 6(1):19-20.
13. M. Porselvi, M. Muthamizh, E. Pathima, et al. Effectiveness of video-assisted teaching on knowledge regarding breast self-examination among women in selected rural areas at Villupuram District. Gal Int J Health Sci Res. 2021; 6(3): 75-81. DOI: https://doi.org/10.52403/gijhsr.20210712.
14. Almaeen A, Wani FA, Thirunavukkarasu A. Knowledge and attitudes towards stem cells and the significance of their medical application among healthcare sciences students of Jouf University. PeerJ. 2021 Jan 19;9:e10661. doi: 10.7717/peerj.10661. PMID: 33552720; PMCID: PMC7821763.
15. Williams, P., Klersy, C., Karki, C. *et al.* Mesenchymal Stem Cell Therapy Awareness, Knowledge, and Use for the Treatment of Fistulizing Crohn's Disease: An International Survey Among Gastroenterologists and Colorectal Surgeons. *Adv Ther* **39**, 2761–2777 (2022). https://doi.org/10.1007/s12325-022-02113-5.
16. Tomar Sonam, Khatoon Parveen, Malik Rehnuma, Issachar Aradhna, Rana Payal, Ram Pradeep, Hansda Andrew. A Study to assess the level of knowledge regarding Umbilical cord blood stem cell banking among antenatal mothers in selected hospitals, Dehradun. International Journal of Advances in Nursing Management. 2022; 10(3):237-2. doi: 10.52711/2454-2652.2022.00055
17. Shaheen, Ruchi Chauhan. A study to assess the level of knowledge regarding umbilical cord stem cell banking among staff nurses at selected Hospitals of Haridwar Uttrakhand. International Journal of Nursing Education and Research. 2021; 9(4):429-3. doi: 10.52711/2454-2660.2021.00099