

The role of nursing in cell therapy

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Abstract:

Today we are witnessing significant advances in basic sciences, tissue engineering and the application of cell therapy as a new and alternative method for the treatment of many diseases. By using cell therapy in the treatment of patients, we can promise them an increase in life expectancy, an increase in quality of life. In this treatment, nurses have a special role in various fields such as: counselor, caregiver, educator, patient support, etc. Therefore, in this study, we intend to investigate the role of nurses in cell therapy and tissue engineering.

Keywords: Cell therapy; Nursing; Treatment.

1. Introduction

Today we are witnessing significant advances in basic sciences, tissue engineering and the application of cell therapy as a new and alternative method for the treatment of many diseases [1, 2]. Cell therapy is a therapy in which viable cells are injected, grafted or implanted into a patient in order to effectuate a medicinal effect [3, 4]. The first cell therapy was performed about 80 years ago. Cell therapy originated in the nineteenth century when scientists experimented by injecting animal material in an attempt to prevent and treat illness [5].

Dr Edward Donnell Thomas performed the first successful bone marrow transplant in Minnesota in 1956 [6]. The first stem cell injection for the treatment of anemic diseases was performed in 2004 by researchers at the Royan Research Institute to repair heart damage caused by stroke in Iran. Currently, research for the treatment of more than 40 different

diseases in the fields of skin, orthopedics, heart, neurology, kidney, eye and reproduction and women in Royan Research Institute is undergoing clinical trials. Most clinical research in the field of cell therapy is conducted in the United States, Europe and China [7].

Round- Fortunately, through years of research, cell therapy has opened a new horizon for the treatment of some diseases. This treatment is hopeful and saves patients who have not yet been treated with existing treatments or whose treatment has not been satisfactory [8, 9]. Extensive studies in the field of cell therapy show that this method is effective and saving for the treatment of many congenital and acquired diseases. Therefore, universities and research centers promise patients to increase their life expectancy and increase their quality of life by using this treatment method [8, 9, and 10]. A dramatic change in the

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medical sciences has taken place following recent advances in the basic sciences, especially cellular and molecular sciences [11].

Success is always the result of a team's performance. Certainly nursing as a member of the treatment team is influenced by this new science. The nursing perspective is to use all available facilities to provide the best care for the client and improve the health of the individual and society [12]. Now, with the increase in the speed of knowledge production in the world, the science of nursing as an interdisciplinary science must be accompanied by major advances and changes in various sciences [13]. Nursing, as a dynamic science and related to basic sciences, should prepare the ground for the use of new achievements in cell therapy and explain its position and theories regarding such new approaches [14, 15].

2. Method

We searched several databases such as PubMed, Scopus, and web of science and used Google Scholar search engine to find the articles in this issue. Based on the purpose of the study, the text of each article was reviewed several times. In the following, we will describe some of the nursing roles in cell therapy.

3. Nursing care of patients with stem cell transplantation:

Hematopoietic stem cell transplant (HSCT) is used to treat some diseases, such as: Acute myelogenous leukemia (AML), chronic lymphocytic leukemia (CLL), chronic myelogenous leukemia (CML), Lymphomas (Hodgkin and non-Hodgkin) [16, 17].

Nurses trained in the field of hematopoietic stem cell transplantation have extensive experience in stem cell infusion, chemotherapy administration, acute symptom management, and care for highly complex patients [18, 19]. These nurses adjust the care plan by identifying the patient's condition and possible complications of stem cell transplantation. Then, they support and care for the patients based on the nursing diagnoses and the nursing process [19, 20]. (The nursing process functions as a systematic guide to client-centered care with 5 sequential steps. These are assessment, diagnosis, planning, implementation, and evaluation) [21, 22]. On the other hand Treatment of patients with Hematopoietic stem cell transplant puts them at risk for Sepsis, shock, Neurologic failure, acute renal failure, acute bleeding, Infection, Multiorgan failure, Cardiac failure, metabolic disorders and Anemia. Therefore, patients need to be admitted to the intensive care unit (ICU) [23, 24].

Nurses, as ICU specialist care providers, play a key role in treating these patients. When admitting these patients, nurses work in the intensive care unit in three main areas: education, communication and patient support [25]. After Hematopoietic stem cell transplant (HSCT) and admission of patients in the intensive care unit, determining nursing diagnoses and planning the nursing process is essential. Based on the patient's condition, nursing diagnoses are determined and a care plan is implemented.

4. Different roles of nurses in stem cell transplantation:

Kaoana Lima and Elizabeth Bernardino Reviewed nursing care in hematopoietic stem cell

transplantation, and they identified three key roles of clinical nurse, management nurse and visit nurse.

The activities of the clinical nurse in the care function is included: Self-care activities, Environmental care, Patient protection, Verification and monitoring of patient data, Care for medication therapy, Response to patient requests, Care related to procedures, Execution of Nursing, Disposal and storage of waste and materials, Care for Hickman catheter, Care for intravenous therapy, Procedure-related care, Platelet activities. The Activities of visit nurse in care function is included: Patient protection, Patient forwarding, Documentation and registers. Activities of management nurse in care function are included: General technical care and specialized technical care for Patient protection [26].

Also, new nursing diagnoses should be used in the field of cell therapy.

5. Conclusion

The nursing profession is inseparable from the care of patients undergoing cell therapy. Patients undergo cell therapy in specific and sometimes critical situations. Caring for and supporting these patients with great complexity is highly dependent on nursing interventions. Performing various types of nursing care and interventions requires basic training and education. Nurses need a set of skills and knowledge to reach a level of expertise, ability and competence and to be able to develop an accurate and principled care program for patients undergoing cell therapy. Nurses as a member of the treatment team can apply the appropriate care and treatment process for clients by knowing the new treatment methods of cell therapy. Complete topics in the field of cell therapy should be added to new books and reputable nursing resources.

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