

The use of mesenchymal stem cells in the treatment of premature ovarian failure

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Abstract

Premature Ovarian Insufficiency (POI) refers to the loss of ovarian function before the age of 40. POI is one of the most common causes of infertility. Globally POI affects 3.5 percent of women. Some of the causes of premature ovarian failure are autoimmune disorders, genetic diseases, environmental factors and unknown causes. In most women, the experience of infertility has a negative impact on various aspects of their quality of life and causes significant social and psychological problems. Due to the complexity of premature ovarian failure, there are various treatments such as hormone therapy, counseling, exercise and nutrition, but they have not been encouraging enough. Therefore, finding a way to restore ovarian function is of particular importance. The purpose of this review is to focus specifically on the treatment of premature ovarian failure with Mesenchymal stem cells (MSCs), and the results of the studies show positive effects on the reconstruction of the structure of the ovaries, the increase of healthy follicles and the reduction of atresia follicles.

Keywords “Mesenchymal Stem Cells ,Premature Ovarian Failure , Infertility ”.

Introduction

Infertility is a major problem of modern society and according to the World Health Organization, infertility is a health problem that affects the whole world. Infertility in women can be caused by various causes that affect the function of the ovaries. One of the most common causes of female infertility is premature ovarian failure. Premature ovarian failure is a disease that occurs before the age of 40. In most women, the experience of infertility has a negative impact on various aspects of their quality of life and causes significant social and psychological problems. POF treatments include hormone replacement therapy, androgen, counseling, androgen dehydroepiandrosterone, exercise, and diet, which reduce the effects of estrogen reduction in the body to some extent, but are not considered a definitive treatment for this disease. Mesenchymal stem cells are a promising method to manage various diseases. MSCs can be isolated from various sources, including bone marrow, fat tissue, amniotic fluid, umbilical cord, placenta and skin. Stem cells possess the unique ability of self-renewal and regeneration, making them potentially effective in addressing ovarian failure and subsequent infertility.

Search Strategy

This study is a systematic review that was conducted through searching Scopus, PubMed, Web of Science and Google Scholar databases with the keywords Mesenchymal Stem Cells ,Premature Ovarian Failure and Infertility, After applying the inclusion and exclusion criteria, 6 articles from 2018 to 2023 were extracted and analyzed.

Results Discussion

Stem cells therapy has been proposed as a potential substitute for treating several illnesses and has been classified as regenerative medicine. One of the types of stem cells is Mesenchymal Stem Cells. studies demonstrated that MSCs could lead to hormone-level restoration, follicular activation, functional restoration of the ovaries, increase the number and function of follicles and regulate the hormonal system. The studies conducted on animal samples were more than human, but it seems that mesenchymal stem cells have a potential ability to improve the function of the ovaries and increase the chances of fertility in people with premature ovarian failure.

Conclusions

One of the ways to treat POF is the use of mesenchymal stem cells, these cells have an extraordinary capacity for repair and regeneration, which helps them in repairing depleted ovaries. The results of this review article indicate that the use of MSCs can be considered as a potential treatment method in these patients.

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