

The characterization of CD marker profile of breast milk-derived stem cell

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Background

The mammary gland in humans is a dynamic organ that undergoes significant developmental changes during pregnancy, lactation, and involution. Stem cells derived from human breast milk possess the adult stem cell-like characteristics such as self-renewal, proliferative and differentiate potential. This source of stem cells avoids invasive procedures and the ethical controversy of embryonic stem cells. In this study we aimed at identifying the human breast milk as a source of stem cells by the expression of hematopoietic and mesenchymal stem cells markers using flow cytometry and immunocytochemistry assay.

Methods

Human milk samples were collected in sterile tubes manually. The samples were collected from day 0 until month 6 post-delivery, usually in the morning. The breast milk was diluted 1:2 with DMEM medium, centrifuged at 300g for 20 min. The cell pellet was washed twice with PBS contains 7% FBS. The cells were subjected to analysis of cell surface antigenic using flow cytometry.

Results

The study provides evidence for the existence of mesenchymal stem cells in human breast milk. Flow cytometric analysis illustrated that breast milk stem cells were positive for surface markers associated with stromal and/or mesenchymal stem cells such as CD90(41.6_±0.4), CD44(88.3_±4.3), CD271(81.2_±5.8), CD106 (9.5_±1.4) and TRA 60-1(10.55_±0.75) while lacking CD105(2.64_±0.55), CD 73(3.8_±0.51). They had negative reaction for hematopoietic markers CD34 (2.7_±2.1), CD123 (4.6_±1.1), CD133 (2.85_±0.65) and also positive for embryonic markers like OCT 4, NANOG, SOX2 which was shown by immunocytochemistry.

Conclusion

The presence of multipotent stem cells in human milk suggests that breast milk could be an alternative, non-invasive, accessible source of stem cells for autologous cell therapy in future.

Keywords: Human breast milk, Mesenchymal stem cells, Multipotent ability.

Poster Presentation

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