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Evaluation the potential anticancer effects of human amniotic fluid derived stem cells (hAFDSCs) on ovarian cancer cells *in vitro*

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Objective: Human amniotic fluid derived stem cells (hAFDSCs) as a novel and available source for cellular therapy become attractive topic for researchers. One of the most common gynecological tumors with poor prognosis and high mortality is ovarian cancer. The response to current therapies is poor and have frequent recurrence in patients, thus, the aim of our research is to create unique therapeutic techniques for ovarian cancer patients.

Materials and methods: After obtaining the patients' written consent, 5 ml amniotic fluid was prepared by amniocentesis from 10 pregnant women (16 and 20 weeks of gestation) with positive double test at first trimester to do fetal karyotyping in Teaching-Alzahra hospital of Tabriz, Iran. Isolated and characterized hAFDSCs between 3th and 5th passages were used for research. The anticancer effect of hAFDSCs was tested by two methods: 1.Co-cultured with ovarian cancer cells (SKOV3) using transwells in 24 wells plate, 2. Using fresh or frozen/thawed supernatant of hAFDSCs on SKOV3. As a negative control, human skin fibroblast cells (HSFCs) were used. After 5 days of test cell viability were evaluated with LDH and MTT assay.

Results: Comparison between two methods in our study show that co-cultured with SKOV3 using transwells is more reliable than supernatant of hAFDSCs on SKOV3. LDH and MTT assay showed 79% viability and 21% cell toxicity for method 1 but for method 2 we observe just 10% toxicity effect for fresh supernatant and frozen medium did not have toxicity effect. We observe significant growth inhibition on ovarian cancer cells by method 1.

Conclusion: Our finding indicate that hAFDSCs can daily release soluble factors and cytokines in cell culture that they have suitable anticancer effect, so when second method are used for 5 days and without fresh soluble factors, growth inhibition on ovarian cancer cells has not been observed. Therefor the best anticancer therapeutic effect of hAFDSCs can be obtained through direct exposure of hAFDSCs medium on SKOV3 cell line at cell culture condition. As a future plan we will investigate the apoptosis-related genes expression using real-time PCR to identify regulating apoptotic signal pathways.

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