Leech saliva extract increases mesenchymal stem cells proliferation and viability: *In vitro* study

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Medical leech therapy has been the subject of many scientific studies for years. However, the material basis of the leech in cell growth was not yet clear. First, this study proposes to evaluate the bioactivity of leech saliva extract (LSE) in mesenchymal stem cell culture. Effect of LSE was investigated on the viability and proliferation of bone marrow-derived mesenchymal stem cells *in vitro*. BM-MSCs were cultured and treated with 2 different doses of LSE. The proliferation rates and viability percentages of cells were calculated during 3 passages. The experiments were performed in three groups: BM-MSCs cultured with a high (1.00 mL) dose of LSE-Dose1 (LSE-D1); MSCs cultured with a low (0.2 mL) dose of LSE-Dose2 (LSE-D2); and MSC culture groups. LSE increased cell proliferation and viability in vitro ($P<0.05$). LSE-D2 showed the highest activity, increased cell proliferation, and cell viability in vitro ($P<0.05$). Cell culture can affect the cell population profile and change cell differentiation. These findings demonstrated that LSE-D2 interferes with MSCs' growth kinetics. Leech salvia extracts increased cell proliferation and viability in stem cell culture.

Keywords: Drug therapy, *Hirudo verbana*, Mesenchymal stem cell, Proliferation, Trypan blue, Viability