

Hydro massage therapy of hands and forearms helped decrease the complaints of pain in the forearm and shoulder region, decreased sweating and cold sensation in 75% of sonographers with 10 or more years of experience and in 92% with experience between 5 and 10 years.

Conclusions: An efficient method to prevent polyneuropathy of the upper extremities in medical sonographers is warm water hydro massage therapy of the hands and forearms for 2 minutes every hour of work. A special spray brush mounted on the water faucet can be used for such therapy.

Keywords: sonographers, polyneuropathy.

STEM CELL THERAPY IN EXPERIMENTAL TYPE I DIABETES IN RATS

Nacu Victoria, Trifan Victoria, Bitca Angela, Lisii Cornel

Academic adviser: Nacu Viorel, M.D., Ph.D., Professor, State Medical and Pharmaceutical University "Nicolae Testemitanu", Chisinau, Republic of Moldova

Introduction: Diabetes mellitus is a multisystem disease with biochemical and structural consequences. It is a chronic disease which results from the progressive inability of the pancreas to secrete insulin because of autoimmune destruction of the beta cells.

Type 1 diabetes causes an estimated 5%–10% of all diabetes cases or 11–22 million worldwide. Type 1 diabetes usually starts in children aged 4 years or older, with the peak incidence at 11–13 years. The stem cell therapy is a new direction in the treatment of type 1 diabetes mellitus.

Materials and Methods: The experiment was done on 100 rats which weighed 180–220g and were 9–12 months old.

The diabetes was induced by intraperitoneal injection of 1 ml of 5% alloxan solution, that causes insulin-dependent diabetes in animals, called alloxanic diabetes, similar to type I diabetes in humans. After 7 days of hyperglycemia, alloxan induced diabetes was considered stable.

The pancreatic cells were extracted from the pancreas of donor rats. The pancreases were first cut in small fragments of 1mm³ then washed 2–3 times with HBSS and then digested with 0,5 g/l collagenase (Sigma Type V 663 U/mg). The pancreatic fragments were incubated for 1 hour in enzyme solution, and then the enzyme was inactivated with Hanks solution. The obtained mass was centrifuged at 1000 rpm and the cells from the upper portion of the supernatant were extracted and then cultivated. The digestion of the pancreatic substance and the extraction of the upper portion of the supernatant were done 3 times. The cells were cultivated in DMEM/F12 (8mM glucose) medium with 1g/l ITS supplement (5mg/l insulin, 5mg/l transferin, 5mg/l selenium, Sigma), 100 UN/ml penicillin, 100µg/ml streptomycin, 2g/l BSA, 10 mM nicotinamide and with keratinocid growth factor (KGF). The cells were cultivated 3, 5, 7, 9, 13 days.

The umbilical stem cells were obtained from the umbilical cord blood of rat embryos.

Results: The animals were treated with pancreatic cells in suspension injected intraperitoneally 1 ml 3 times with an interval of three days between injections and with umbilical stem cells in suspension $9,8 \times 10^6$ cells/ml - 1 ml intraperitoneally 3 times with 3 days between injections.

The results show that rats treated with umbilical stem cells and pancreatic cells significantly lowered their blood glucose levels and increased their lifespan, as compared with untreated mice.

The mice that received pancreatic cells show a blood glucose level slightly lower than in mice treated with umbilical stem cells.

Key words: stem cells, pancreatic beta cells, rats, type I diabetes, hyperglycemia, alloxan.