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The prognostic value of p53 mutation in pediatric marrow hypoplasia

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Abstract

Background: The tumor suppressor gene p53 is involved in the control of cell proliferation, particularly in stressed cells. p 53 gene mutations are the most frequent genetic event found in human cancers. Fanconi Anemia (FA) is the most common representative of inherited bone marrow failure syndromes (IBMFS) with a leukemic propensity.
P 53 DNA alteration has not been studied before in Egyptian children with FA.
Patients and methods: we investigated p53 mutation in the bone marrow and peripheral blood of forty children,FA (n = 10), acquired aplastic anemia (AAA) (n = 10), and immune thrombocytopenia (ITP) as a control (n = 20),using real-time PCR by TaqMan probe assayResults: Mutation of p53 gene was demonstrated in the BM of 90% (9/10) of children with FA, compared to 10%(1/10) in AAA ($p < 0.001$), while, no p53 DNA mutation was seen in the control group. A positive correlationbetween DNA breakage and presence of p53 mutation was seen in FA ($p < 0.02$, r0.81).
Conclusion: mutation of p53 gene in hypoplastic marrow especially FA may represent an early indicator ofsignificant DNA genetic alteration with cancer propensity.

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Effect of human umbilical cord blood CD34+ progenitor cells transplantation in diabetic mice

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Abstract

Shortage of donor organs spurs research into alternative means of generating β cells. Stem cells might represent a potential source of tissues for cell therapy protocols, and diabetes is a candidate disease that may benefit from cell replacement protocols. We examined the effect of transplanted human umbilical cord blood CD34+ cells on some detailed parameters in streptozotocin- (STZ) induced diabetic mice. An experimental study was conducted in the departments of clinical pathology, physiology and pathology of Faculty of Medicine, Suez Canal University. Thirty male albino mice 8–12 weeks were included and subdivided into 3 groups, first group served as normal control group, second group as diabetic control after induction of diabetes with STZ and third group treated diabetic mice by injection of positively selected CD34 progenitor cells from human umbilical cord blood (HUCB) with a dose of one million cells/mouse. Blood glucose and serum insulin were measured at specific time interval and immunohistochemical (IHC) analysis and histopathology on pancreas were conduced. Data were analyzed using chi square between groups. Intravenous injection of CD34+ cells caused significant improvement in blood glucose level (277.9±102.5 mg/dl in treated group vs 530.3±99 mg/dl in untreated group, $p<0.01$). Blood level of mouse insulin was higher in the treated group as compared with untreated diabetic mice (0.77±0.2 ng/ml in treated group versus 0.26± 0.09 in untreated group, $p<0.001$). IHC analysis for detection of human insulin producing cells in pancreas of treated mice revealed that 33.3% positive cellular staining and 55.6% positive sinusoidal staining were detected. In conclusion, Transplantation of HUCB-CD34+ cells appear to be a modality of stem cell therapy in diabetes mellitus.