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AUTOLOGOUS BONE MARROW MONONUCLEAR CELL (ABMMC)TRANSPLANTATION IN TYPE 1 AND TYPE 2 INSULIN DEPENDENT DIABETES MELLITUS (IDM)

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Abstract:
Background: Recent reports have shown that bone marrow-derived stem cell may contribute to islet regeneration. The goal of our study was to evaluate the safety and efficacy of ABMMC transplantation for patients with IDM.
Methods: From June 2005 to January 2007, 28 consecutive patients: 8 Type 1 IDM (T1DM) and 20 type 2 IDM (T2IDM); who were receiving maximal medical therapy including insulin treatment for. Median time of disease for T2IDM patients was 13 years, without presence of pancreatic islet auto-antibodies. After IRB approval and signed informed consent, bone marrow was harvested and ABMMC were isolated and infused directly into the pancreas via splenic artery using endovascular catheters. Glucose, glycosylated HbA1c and C peptide were measure before and after transplantation. HOMA2 Calculator v2.2 was used to calculated IR and % B (*if Glucose : 3.0 to 25.0 mmol/L and C-peptide : 0.2 to 3.5 nmol/L).

Results: There were no study related complications. At 1 year follow-up, mean daily insulin requirement was the same in group T1DM and significantly reduced in group T2IDM, from 42.5 to 4.5 U/d ($t=7.94$, $p<0.001$). Ten of the twenty (50%) T2IDM established complete insulin independence. Data is shown in table 1.

Conclusions: The use of ABMMC transplantation for T1DM and T2IDM is safe. In this pilot study, only T2IDM patients have significant improvement in pancreatic function demostrated by better glycemic and HbA1c control, and are associated with a significant independence of the insulin. This has formed for a randomized multi-center study which is currently in progress.

Table 1. Median values

	Pre	**Post**	**t**	***p***
T2IDM (n=20)				
Fasting Glucose (mmol/L)	10.8	6.6	3.98	0.01
Glycosylated HbA1c (%)	9.6	8.1	3.98	0.01
C Peptide (nmol/L)	0.5	0.84	5.11	<0.01
HOMA 2 IR (n=17)*	2.2	2.26	0.94	0.92
HOMA 2 % B (n=17)*	42.4	130.2	4.9	<0.01
T1DM (n=8)				
Fasting Glucose (mmol/L)	10.1	11.1	1.382	0.21
Glycosylated HbA1c (%)	8.7	8.7	0.45	0.66
C Peptide (nmol/L)	0.17	0.16	1.00	0.35

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