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ALLOGENIC WHARTON'S JELLY MESENCHYMAL STROMAL CELLS INTRAVENOUS INFUSION INCREASE SERUM INSULIN-LIKE GROWTH FACTOR 1 AND DEHYDROEPIANDROSTERONE IN HEALTHY VOLUNTEERS

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Background: The clinical effects of mesenchymal stromal cell (MSC) have been postulated to be due to its paracrine action and ability to stimulate regeneration or restore homeostasis through various growth factors. Insulin like growth factor-1 (IGF-1) has cellular growth promoting effects especially for neuron, skeletal muscle, liver, kidney and lungs. Dehydroepiandrosterone (DHEA) is an endogenous metabolite intermediate in the biosynthesis of the androgen and estrogen sex steroids, and is thought to be able to regulate metabolism, mood, weight and sleep. The aim of this study was to determine the effect of intravenous Wharton's Jelly-derived MSC (WJ-MSC) infusion on serum IGF-1 and DHEA levels in healthy volunteers.

Methods: WJ-MSC from the umbilical cord of a healthy newborn was harvested and expanded ex vivo after full informed consent from the parents and comprehensive health screening including genetic analysis is performed. 10 healthy volunteers were recruited (mean age 45 years; 6 men). All participants received 50million WJ-MSC intravenously. 20 mls of venous blood were collected at baseline, 3 months and 6 months for screening.

Results: All participants tolerated the procedure well with no immediate allergic reactions or complications. Baseline bloods including IGF-1, DHEA, testosterone (males only), oestrogen and progesterone (females only) were within normal range. At 3 months mean levels were generally higher when compared to baseline for IGF-1 (220 vs 240 ug/L) and DHEA (4.4 vs 5.7 umol/L). At 6 months mean levels were higher than baseline for IGF-1 (220 vs 245 ug/L) and DHEA (4.4 vs 4.9 umol/L). There were no differences seen with other parameters including full blood count, fasting blood glucose levels, renal profile, liver function tests and serum tumor markers.

Conclusions: The paracrine effects of allogenic WJ-MSC may be mediated by IGF-1 and DHEA. Larger studies are warranted following this preliminary safety report.