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**Autologous Stem Cell-Enriched Injection for Osteoarthritic Joint**

Robert Simons1,3, Jenny Truong1,2, Natasha Simons3, Imran Khan1,2, Ricky R. Lareu1,2

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Background: Osteoarthritis (OA) is the most common joint disease, affecting 9% of the Australian population. An age-related disease, it is predicted to rise with increasing obesity and life expectancy. It involves damage to joint cartilage and bone, resulting in chronic pain, diminished mobility and reduced quality of life. With currently no treatment that can reverse the course of the disease, the symptoms are managed with anti-inflammatory drugs, analgesics, exercise and joint replacement. Tissue regeneration through stem cell therapy is an increasingly attractive and attainable strategy. Herein we describe preliminary data on an effective single-dose joint injection enriched in autologous stem cell.

Methods: A 5mL heamoderivative was prepared form patient blood in the morning to inject into an OA joint in the afternoon. Briefly, a sequence of centrifugation steps were use to concentrate very small embryonic-like stem cells (VSELs) from blood and combine with platelet-rich plasma (PRP). Patient self-reporting pain score from 0-10 was used to evaluate 23 consecutively-treated patients at pre-treatment and 6 weeks and 6 months post-treatment. Preliminary diagnostic analysis for the presence of VESLs was conducted with flow cytometry.

Results: Twenty patients reported their pain scale at all three time-points. At 6 weeks 15% of patients reported <2.5 points in pain reduction, while 55% reported pain reduction between 2.5-5 points and 30% reported >5 points in pain reduction. At 6 months, reported reduction in pain points were: <2.5, 25%; 2.5-5, 35%; >5, 40%. Two patients became pain-free at 6 weeks and remained so at 6 months. Preliminary diagnostic assessment of the haemoderivative revealed that the majority of cells classified as VSELs were negative for nuclear stain, not reported in the literature.

Conclusions: A single dose of stem cell-enriched, autologous haemoderivative injection into an OA joint is a viable approach to reduce joint pain.