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In vitro COMPARATIVE STUDY BETWEEN TWO TYPES OF CHONDROGENIC MEDIA ON MICE BM-MSCs

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Abstract

Various types of adult mesenchymal stem cells (MSC) have been isolated from several tissues. The aim of this present study was to compare between two types of Chondrogenic media by using (2D) culture. Bone marrow was isolated from mice with 4 - 8 weeks in age, under sterilized laboratory conditions. It was cultures in an incubator with 37 °C and 5 % CO_2 with MEM 10 %. The cells reached to monolayer after 7- 8 days, and it was disaggregated by use trypsin enzyme. The result of differentiation showed the stander medium had cells with big size and many large cellular aggregates compare with ICA media. Cellular aggregates form in the first week of differentiation until the last day of experiment, while ICA media showed the cellular aggregates begun to decrease after the second week then died. The results of Alcian blue and immunocytochemistry were positive in two media starting with the next weeks of differentiation.

Key words: MSCs, Icarrin, Differentiation, Chondrogenic media and Mice.

1. Introduction

Osteoarthritis (OA) is the most common cause of long term disability in most populations of people over 65 years old and is one of the leading causes of invalidity in adults (Buckwalter *et al.*, 2004). In this disease the articular cartilage and sub-chondral bone of the affected joints are damaged. Unfortunately, damaged articular cartilage has a limited abilityto heal (Redman *et al.*, 2005). Mesenchymal stem cells (MSCs) are characterized as undifferentiated cells able to self - renew with a high proliferative capacity and possess a mesodermal differentiation potential (Pittenger *et al.*,1999). MSCs can be harvested from numerous tissue sources including bone marrow and adipose tissue followed by *ex vivo* expansion of isolated cells (Singer *et al.*, 2011). Bone marrow has been the main source for the isolation of multipotent MSCs (Mueller *et al.*, 2001; Stenderup *et al.*, 2003).

MSCs hold great appeal for regenerative medicine therapeutic approaches in both human and veterinary medicine given their potent immunomodulatory and pro-regenerative properties (Carrade and Borjesson, 2013). MSCs of multiple adult vertebrate species have been demonstrated to differentiate into lineage-specific cells that form bone, cartilage, fat, tendon and muscle tissue (Alhadlaq and Mao, 2003; Alhadlaq *et al.*, 2004). In addition to differentiation into their natural derivatives, MSCs have the potential to differentiate into other types of tissue forming cells such as hepatic (Petersen *et al.*, 1999), renal (Poulsom *et al.*, 2003), cardiac (Orlic *et al.*, 2001), and neural cells (Brazelton *et al.*, 2000).