

Goat adipose derived stem cells (G-ADSC) for therapy of injuries caused by chronic mastitis: preliminary results

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Abstract

The use of mesenchymal stem cells in regenerative medicine is not a novelty, however, stem cell therapy for fibrosis occasioned by chronic mastitis was not studied yet. This study aimed to evaluate goat adipose derived stem cells (g-ADSC) for goat chronic mastitis treatment. The cell culture of g-ADSC fat was collected by subcutaneous goat chest and isolated by mechanic dissociation and enzymatic digestion with collagenase type I (1 mg/mL). Cells were characterized as mesenchymal cells by differentiation, unit forming colonies (UFC) and flow cytometry with CD 90, CD 105 and CD45. The cells were expanded to a concentration of 4×10^6 per animal, labeled with Qdot® fluorescent nanocrystals (Qtracker®), and transplanted by direct injection in left mammary gland. The contralateral mammary gland was used as control with PBS injection. Before infusion microbiological tests, antibiotic therapy, ultrasonography examination and histopathological analysis were performed. The histological slides were stained with Hematoxylin-Eosin and Masson's Trichromy. Images were obtained by software Image Pro Plus®. The same procedures were repeated after 30 days. The presence of fibrous tissue in the parenchyma of the mammary gland prior to cell infusion on histopathological examination and ultrasound was identified. The ultrasonographic findings are suggestive of inflammation, since different intensities of determining brightness of images are heterogeneous echogenic by the presence of fat, glandular fluid (milk), however this echogenicity is altered by the presence of fibrous tissue resulting from healing of lesions caused by inflammation. There was greater involvement of the peripheral tissues of the udder cistern. The interior of the tank showed up hypoechoic, indicating the presence of milk. The tissue changes are in agreement with the results of the histopathological analysis, which showed intense proliferation of connective tissue, aggregates of macrophages, epithelioid and giant cells and absence of normal morphology of mammary alveoli. After g-ADSC infusion was observed in ultrasonographic more homogeneous pattern of echogenicity, with less indication of fibrous tissue. There was also no difference in histopathology, with the reduction of the fibrous tissue. The therapy with g-ADSC was performed to repair the damage in the mammary gland of goats for a long time with chronic mastitis and regain function. However, although preliminary results are suggestive that there has been progress in the repair of lesions in the gland, it is not yet



possible to make further conclusions. It is also necessary to investigate the functionality of the mammary gland regarding the quantity and quality of milk production.

Ethics Committee: UFPI/ EAEC nº 037/12.