Mesenchymal stem cell progenitor content in donor bone marrow harvest might be predictive of a better outcome following bone marrow transplanation

MESENCHYMAL STEM CELL PROGENITORS IN BOW MARROW MIGHT BE PREDICTIVE OF A GOOD OUTCOME

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INTRODUCTION

Mesenchymal stem cells (MSCs) are multipotent stem cells that are easily isolated from bone marrow and have a important role in supporting haemopoiesis and for their bystander and immunomodulant proprieties. We investigated the outcome of allogenic BM transplanted patients on the basis of the MSC characteristics isolated from the BM samples.

MATERIALS AND METHODS. We isolated MSCs from directly plated BM samples and cultivated for 3-4 passages in an MSC medium containing 10% foetal calf serum. We analysed MSCs for: i) the number of fibroblast colony forming units (CFU-F); ii) growth rates at the first passage (defined as detached/ plated cell numbers)and the cumulative population doubling, iii) immunophenotype (CD45,34,14,90,73,105,146) . We then stratified these results according to their median values and analyzed the number of WBC/kg, CD 34+ cells %,CD34+ cells/kg, LTC-IC/kg, CFU-GM/Kg, BFU-E/kg, the PMN and PLT engraftment, and the presence of GvHD. T test and Chi square test were performed as statistical analyses.

RESULTS.

We isolated MSCs from 39 donors with a median of age of 27 years (18 pts >18years and 8 <18years). The CFU-F analysis was only carried out on 8 samples and we observed that the samples with more CFU-U/kg (>140 CFU-F/kg) were also the samples with more WBC/Kg (significant data , $p>0.05$) and the number of CD34+ cells /kg. but there are insufficient data for a complete analysis

We stratified the data on the basis of the median P1 rate (0.124) and observed an inverse correlation of the number of detached cells at the first passage with the number of WBC/Kg ($P<0.05$) and the number of CD34+ cells, the LTC-IC, CFU-GM and BFU-E.

PMN engraftment was faster in the samples with a P1 rate >0.124)

We observed no differences on the immunophenotype except for CD146 expression which was inversely proportional to the presence of CD34+ cells, the number of WBC/kg and the PMN engraftment.

Although no significant data were shown for GvHD analysis, it is important to note that the patients treated with the samples containing MSC with a high expression of CD46 at the first passage did not have chronic GvHD.

CONCLUSION These data suggest that the number of MSC progenitors present in the BM might be predictive of a much faster PMN engraftment . These data need larger case reports to confirm the importance of transplanting MSCs with haemopoietic stem cells to have a better outcome after BM transplantation