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16s rRNA sequence analysis of Indian isolates of *Pasteurella multocida*

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Hemorrhagic Septicemia (HS), caused by *Pasteurella multocida*, accounts for heavy mortality in cattle and buffalo resulting in huge economic losses to the livestock industry. The traditional method for typing *Pasteurella multocida* isolates by capsular and somatic typing has a low discrimination power. Hence the present investigation was conducted to characterize *P. multocida* isolates recovered from different species and different regions of the country over a long period of time by employing 16s rRNA gene sequencing. Twenty two isolates of *P. multocida* were subjected to genomic DNA isolation followed by PCR amplification of 16s rRNA gene using prokaryotic universal primers (530F and 1492R). Amplicons were then sequenced and the sequences were assembled, analyzed and compared with sequences from other reported strains. Among isolates analyzed, the similarity was varied between 91.9-100%. Sequence divergence was varied between 0-3.3% with highest divergence found between two sets of isolates viz., serotype A isolate from duck and serotype A from Goat and serotype A isolate from duck and serotype D isolate from pig. Phylogenetically, serotype A isolate from duck was highly divergent from rest of the isolates taken in the study. A total of three lineages were found among which lineage-1 comprised of serotype A isolates and lineage-2 comprised of serotype B isolates, whereas, lineage-3 comprised of A, D and F serotype isolates. These results indicated that 16s rRNA gene sequence analysis could be used for molecular characterization of isolates as well as a molecular epidemiological tool.

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Therapeutic potential of two different doses of human bone marrow derived mesenchymal stromal cells in treating liver cirrhosis

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Introduction: Bone marrow derived mesenchymal stromal cells (BM-MSCs) are multipotent adult stem cells that are isolated and characterized from human bone marrow.

Aim: To compare the therapeutic potential of two different doses of BM-MSCs (low dose and high dose) in treating CCl4 induced liver cirrhosis in Wistar rats.

Materials & Methods: 24 healthy female Wistar rats were used for the study and were randomly divided into four experimental groups: Group A (Control), Group B (CCl4 treated group), Group C (CCl4+low dose of MSCs), Group D (CCl4+high dose of MSCs), each group consisted of 6 animals. On day 0, 6, 12, 18, 24 and 30, blood samples were collected and sera were used for liver enzyme estimation. On the 30th day, animals were sacrificed; liver tissue was used for anti-oxidant analysis and histopathological study.

Results: Liver enzyme levels in serum were increased in the CCl4 treated rats. Treatment with MSCs showed significant decrease in liver enzyme levels and decreased oxidative stress when compared to CCl4 treated group ($p<0.05$). Histopathology examination showed that hepatic architecture of rats treated with MSCs (low dose and high dose) was found to acquire near normalcy when compared to that of CCl4 treated group (Group B).

Conclusion: Results indicated that among the two doses of mesenchymal stem cells, high dose of BM-MSCs treatment was more effective in treating liver cirrhosis when compared to low dose of BM-MSCs ($p<0.05$).

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