Toxicity testing of Normoxic Umbilical Cord Mesenchymal Stem Cell-derived Secretome in Mice

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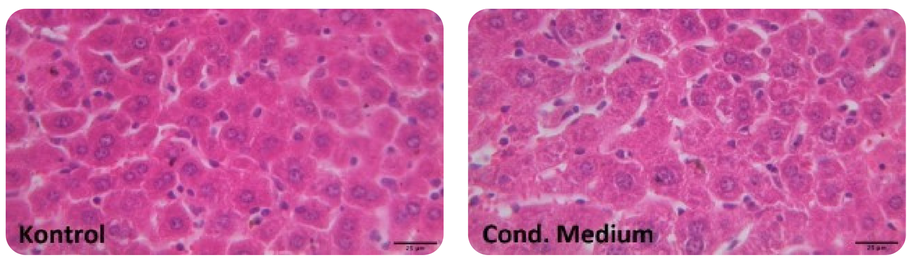
BACKGROUND

Many clinicians around the world are interested in using **Umbilical Cord Mesenchymal Stem Cell-derived Secretome** for treating various diseases. The use of UC-MSC secretome has been widely used, it is thought to be **safe** and has had **no toxic effect** on humans. However, pre-clinical studies in animals are needed to ensure the scientific validity of the data.

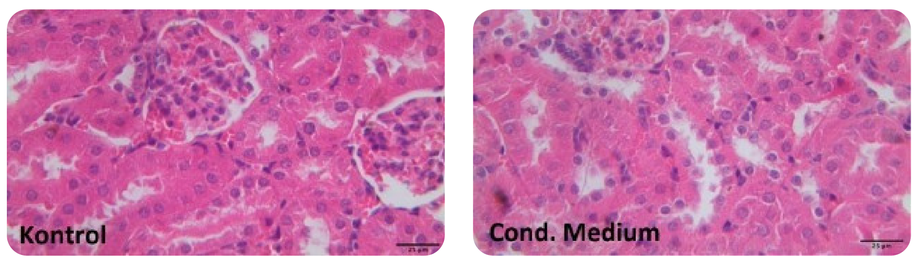
AIMS

This study aims to **identified the toxicity effect** of Normoxic Umbilical Cord Mesenchymal Stem Cell-derived Secretome.

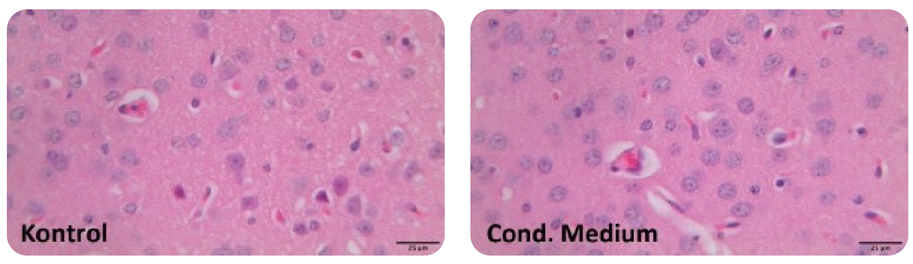
Liver Histopathology



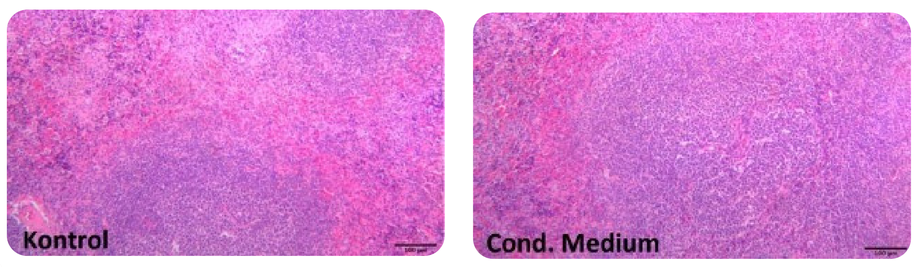
Kidney Histopathology



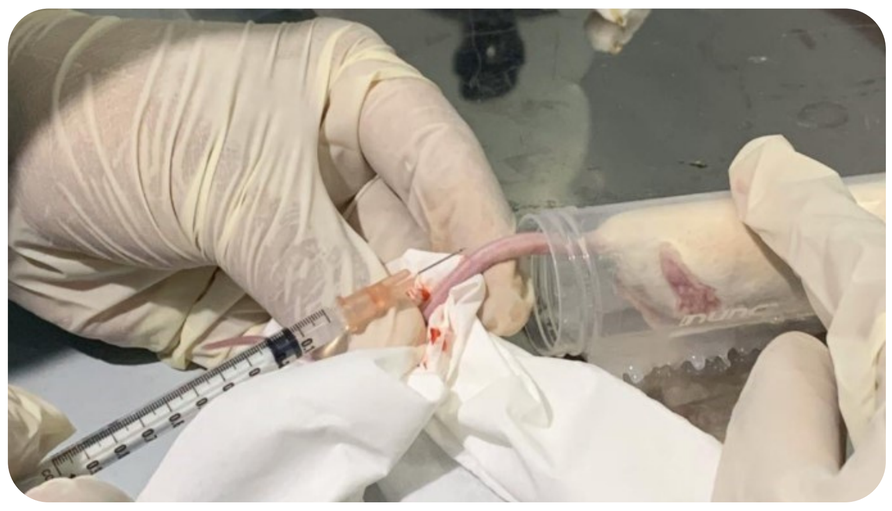
Brain Histopathology



Spleen Histopathology



METHOD



A total of ten healthy ddY (Deutschland-Denken-Yoken) mice (Mus musculus L.) at 10 weeks of age were used in this study. The mice were randomly divided into two groups (n=5 each) and injected intravenously (i.v.) into coccygeal vein with the same dose (0.2 mL) of UC-MSC secretome and normal saline as the control group. Animals were weighed before and daily after the treatment for 14 days to observed their weight gain. At the end of 14 days, the mice were sacrificed. Organs, including kidney and spleen were weighed, whereas for histopathology analysis, kidney, spleen, liver, and brain were collected and observed using paraffin-embedding method.

RESULT AND DISCUSSION

Mice body weights data showed a **gradual increase without any significant differences** ($p>0.05$) between intravenous injection of UC-MSC secretome and the control group. In addition, the data indicated **no negative effect** after UC-MSC secretome treatment with **no signs of appetite loss and daily activity disturbance**. Mortality data also showed **no dead mice** in all groups up to 14 days of experiment. The average weight of the kidney ($p=0.31$) and spleen ($p=0.49$) did not differ between groups. Furthermore, histopathological examination of **the kidney** showed there was **no damage toward nephrotoxicity, no inflammatory infiltration, and no degeneration** due to the treatment. In the spleen, the histopathology result also **did not** show any **significant change in lymphoid** follicles, both red and white pulp in all treatment groups. Similarly, **no histopathological changes** were found in the **liver and brain** between groups.

CONCLUSION

Intravenous injection of UC-MSC Secretome proved to be **safe** and **did not have any toxic effects** in mice.