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Osteosarcoma in Rat Using SJSA-1 Cell Line : Pain Cancer Model Herdiani Sulistyo Putri^{1,2}, Ira Sari Yudaniayanti⁴, Archie Arman Dwiyatna², Faiz Muhammad Ammar², Ahsin Fikri², Suharjono³, Nancy Margarita Rehatta²

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Background and Aims:

Cancer pain animal models have been intensively researched in order to identify adequate study animal models that match the pain experienced by human cancer patients. Bone cancer pain is the most severe type of chronic pain, the underlying mechanism and relationship between physiological and anatomical pain are yet unclear. The SJSA-1 cell line (formerly OsA-CL) comes from the primary tumor of a patient diagnosed with primitive multipotential sarcoma of the femur. However detailed facts about its use in an animal model of cancer pain are not readily available in the search results. The aims is to discover the best way for creating an animal model of cancer pain using the SJSA-1 cell line, which will aid researchers in recommendations for bone cancer pain animal model.

Methods

- In this study, 100k, 300k, 600k SJSA-1 cell line in 10 mcl PBS planted into male Wistar Rattus norvegicus.
- The rats were dissected at the proximal lateral region of the femoral trochanter.
- Then the dental burs were used to make a hole in the femoral bone until it reached the intramedullary area.
- Immunosuppressive medicine was given for 7 days intramuscularly and tapering off.
- X-rays of the femoral bone were checked to reveal lytic process or sunburst appearance which portrayed osteosarcoma.
- The animals were sacrificed on day 21, femoral bone was taken to examine the pathological structure using Hematoxylin eosin stained.

Rats' pain levels were monitored with Electronic Von Frey filament.







On the 14th day, the rats with 600k cancer cells had a lytic app. 3 rats died in the group of 600k cells throughout 21 days of observation, while 5 rats had lytic appearance in X-Ray on day 21st.



After receiving 600k cells, 7 rats developed nodules in the soft tissue of their foot.

Statistics

There was a significant difference in pain intensity by Von Frey filament with a p value of less than 0.05 on day 13.

Conclusions:

In this study, pain model rats with 600k SJSA-1 cancer cells, which might cause bone inflammation and lysis, ultimately leading to cancer. The von Frey test and radiological imaging showed no statistically significant difference between animals injected with less than 300k. The radiological image of the femoral bones in 100k cells group revealed minimal inflammation, but the bones injected with 300k cells were inflamed/opaque on day 7 but healed 7 days later. This is consistent with the pathologic histology of numerous femur bone, demonstrating that in the intramedullary cell replace with osteosarcoma cell.



