Report of "Research Award of Oral Sciences"

Major: Oral Sciences
Grade:4
Department: Stomatognathic Function & Occlusal Reconstruction
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Title: Molecular analysis of neuropathic pain model: an animal study

1. Aim of research and results obtained (Approximately 400 words):

The aim of my study is to use tranilast, a potent drug which has been licensed for use in Japan since 1982 for treating bronchial asthma. Now we propose to check the effectiveness of this novel drug in the treatment of pain. To our knowledge this is the first of a kind experiment in the scientific research till date. Literature search has proved that there is a link between the chronic pain and rate limiting enzyme tetrahydrobiopterin (BH4). Hence, we believe that the approach of this mechanism (BH4) would be a lucrative avenue for exploring a novel drug design for chronic pain intervention. In our research we used male rats (Sprague Dawley) to perform all our experimental procedures. Infra orbital nerve constriction injury model was created, and the rat will be treated with either Tranilast or Saline (Investigator would be blinded). Further to intervention at various time intervals (6,24,48 hours) the effectiveness was analysed by measuring mechanical allodynia using Von Frey assay. Furthermore, the trigeminal ganglion was excised, and various gene expressions was studied. In the von Frey's test, the tranilast and carbamazepine groups showed significant changes in the head withdrawal threshold in the ipsilateral whisker pad area. The motor coordination test showed no changes in the tranilast group, whereas the carbamazepine group showed decreased performance, indicating impaired motor coordination. Trigeminal ganglion tissues were used for the PCR array analysis of genes that regulate the BH4 pathway. Downregulation of the sepiapterin reductase (Spr) and aldoketo reductase (Akr) genes after tranilast injection was observed compared to the pain model. These findings suggest that tranilast effectively treats neuropathic pain.

We intend to identify unknown inhibitory role of tranilast which causes decrease in the BH4 production, and the entire pathway involved would be analysed

using molecular techniques. We hope our results would serve as a new platform to contribute to the existing therapeutics of Tranilast.

2. Self-evaluation of research achievement:
   I have published my preliminary results obtained. Currently carrying out further experiments. I hope I can publish a good research paper with the data I will obtain. Besides I am glad I was able to complete my research work for the PhD on time and was also part of other research groups.