

(Form: Century 11 point, A4 size)

Report of “Research Award of Oral Sciences”

Major: Oral Sciences

Grade: 4

Department: Stomatognathic function and occlusal reconstruction

Name: Shaista Afroz

Title: CGRP induces differential regulation of cytokines from satellite glial cells in trigeminal ganglia and orofacial nociception

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

The aim of the present study was to investigate the role of the SGCs in TG on cytokine-related nociception in response to intraganglionic (IG) administration of CGRP. IG CGRP significantly reduced L/F ratio at 6 hours ($41.5\% \pm 9.0$) and 24 hours ($57.8\% \pm 13.7$) post injection. Stimulus duration/stimulus-contact events were significantly reduced at 6 hours ($61.9\% \pm 12.4$). Injecting Min 1 hour before CGRP significantly increased L/F ratio ($165.145\% \pm 44.74$) compared to the only CGRP injection (41.5 ± 9.0) and stimulus duration/stimulus-contact events (181.9 ± 44.1) to only CGRP (61.9 ± 12.4) at 6 hours. There is a significant increase in GFAP mRNA and protein expression between 1 and 6 hours that was accompanied with a significant increase in expression of cytokine IL-1 β and IL-1RA post CGRP injection and injecting Min 1 hour before CGRP significantly down regulated the GFAP mRNA and protein expression and mRNA expression of cytokines IL-1 β and IL-6. Overnight stimulation of glial rich culture with 1 μ M CGRP led to a more than 1.5-fold increase in the protein expression of 20 cytokines (including IL-1 β , IL-6 and IL-1RA), no change in 6 cytokines (between 1-1.5-fold change) and down-regulation of 3 cytokines, as compared to control conditions.

IG CGRP induces thermal hyperalgesia, which may be related to the secretion of various cytokines within the ganglion. IG administration of Min 1 hour before CGRP alleviated thermal hyperalgesia and downregulated cytokine expression. These findings support the notion that increased glial activity contributes to hyperalgesia and that glial inhibition can be effectively used to alleviate it.

2. Self-evaluation of research achievement:

The outcome of my research are scientifically important and has contribution in the field of orofacial pain. It has lot of future scope and translational capacity.

3. Meeting presentation:

* Title, conference, venue, date, co-author, presentation (oral/ poster).

(Underline the speaker.)

Title- Orofacial Nociception due to Glial expressed Cytokines in Trigeminal Ganglion

Conference- International association of dental research

Venue- Vancouver, Canada

Date- 2019, June 19- June 23

Co-author- Shaista Afroz, Rieko Arakaki, Takuma Iwasa, Masamitsu Oshima, Maki Hosoki, Miho Inoue, Otto Baba, Yoshihiro Okayama and Yoshizo Matsuka

Presentation- Poster

4. Journal publication:

* Title, journal, volume, number, paragraph, date, co-author.

(Underline the speaker.)

Title- CGRP Induces Differential Regulation of Cytokines from Satellite Glial Cells in Trigeminal Ganglia and Orofacial Nociception

Journal, volume, number, paragraph- Int. J. Mol. Sci. **2019**, 20(3), 711;

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