

International Conference on

## DENTAL MEDICINE, TRAUMA AND RECONSTRUCTIVE SURGERY

September 10-11, 2018 Singapore

**Effects of botulinum toxin A on histology and ultrastructure of submandibular salivary glands****Mohamed Yehia Saad Abdelfattah**

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**Introduction:** Botulinum toxin A (BoNTA) has been used for treating hyper-function of various glands such as sweat, lacrimal and salivary glands. However, the long-term histological sequences are largely unknown.

**Objectives:** The present study is to evaluate the histological and ultra-structural effects of BoNTA on Submandibular Salivary Gland (SSG).

**Methods:** 18 6-week-old male albino rats received 0.1 ml of either saline (sham group, n=9) or BoNTA (BoNTA group, n=9) injection in the right SSGs. Of 9 rats in each group, 3 were terminated at 2, 4 and 12 weeks after the injection. The harvested SSGs were embedded and sectioned at 6  $\mu$ m and stained with H&E for histological study. Ultrathin sections (60-90 nm) were cut from 1 mm 3 pieces harvested from the center of SSGs and mounted on copper grids for ultra-structural study using Transmission Electron Microscope (TEM).

**Results:** All sham SSGs showed normal acinar cells with rounded nuclei and regular Striated Ducts (SD) with characteristic basal striations. By TEM, acinar cells exhibited rounded nuclei, mitochondria and secretory granules at cytoplasm. Numerous mitochondria presented in SD. Compared with these features, 2 week BoNTA-injected SSGs showed loss of spherical fashion and basal striations in serous acini and SD, respectively and the cell boundaries were not clear. TEM further revealed irregular nuclei of acinar cells and SD, and swollen mitochondria. In 4 week SSGs, some acini and ducts lost their spherical fashion and in some areas, these structures disappeared. Ruptured mitochondria were observed in acini and SD by TEM. However, all 12-week BoNTA-injected SSGs seemed to have similar structures to those of sham SSGs. By using scoring system for semi-quantifying, the histological structural changes of BoNTA-injected SSGs, 2 and 4 week BoNTA-injected SSGs showed significantly higher scores as compared with their sham counterparts. However, no significant score difference was found between 12 week BoNTA-injected and sham SSGs.

**Conclusions:** Although application of BoNTA results in significant changes in histological structures and ultra-structures of SSGs, these detrimental effects seems to be transient and the major recovery occurs in 3 months. Thus, BoNTA can be used for treating SSG hyper-function.

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