

## INTISARI

**Latar Belakang.** Permasalahan gigi dan mulut pada lansia berkaitan dengan kecenderungan penuaan glandula submandibularis. *Trimethyltin* dilaporkan menginduksi degenerasi khas penuaan pada berbagai organ tikus model. Bahan kimiawi ini berpotensi untuk diteliti sebagai model penuaan glandula submandibularis.

**Tujuan.** Penelitian ini bertujuan untuk mengetahui estimasi rerata volume acinus dan mencari tanda atrofi glandula, atrofi acinus, atrofi ductus convolutus granularis, hiperplasia ductus intercalatus, dan fibrosis di sekitar ductus excretorius glandula submandibularis tikus model penuaan yang diinduksi *trimethyltin* dosis tunggal 8 mg/kg berat badan secara intraperitoneal dan dibandingkan dengan kontrol.

**Metode.** Dua belas ekor tikus galur Sprague-Dawley jantan usia 3 bulan dibagi menjadi dua kelompok. Kelompok induksi *trimethyltin* diberi injeksi *trimethyltin chloride* dosis tunggal 8 mg/kg berat badan pada hari ke-1 penelitian. Pada hari ke-7, 14, 21, dan 28 dilakukan penimbangan berat tikus. Pada hari ke-28 dilakukan nekropsi dan pengambilan glandula submandibularis. Glandula submandibularis ditimbang dan diiris secara acak sistematis untuk mendapatkan irisan isotropi dengan bantuan orientator. Estimasi rerata volume acinus glandula submandibularis dilakukan dengan metode *point-sampled intercept*. Pengamatan atrofi ductus convolutus granularis, hiperplasia ductus intercalatus, dan fibrosis di sekitar ductus excretorius dilakukan secara kualitatif.

**Hasil.** Penurunan berat selama minggu pertama setelah injeksi *trimethyltin* ditemukan pada tiga dari enam tikus. Rerata volume acinus glandula submandibularis tikus kelompok induksi *trimethyltin* tidak berbeda bermakna dibandingkan kontrol, yaitu  $58882,60 \pm 11577,10 \mu\text{m}^3$  berbanding  $58366,20 \pm 18832,55 \mu\text{m}^3$  ( $p = 0,956$ ). Tidak ada perbedaan profil histologis acinus, ductus intercalatus, dan ductus excretorius antara tikus kelompok induksi *trimethyltin* dibandingkan kontrol. Kerusakan sel epitel ductus convolutus granularis ditemukan pada tiga dari enam tikus yang diinduksi *trimethyltin*.

**Kesimpulan.** Tikus model penuaan yang diinduksi *trimethyltin* dosis tunggal 8 mg/kg berat badan secara intraperitoneal hanya menunjukkan perubahan struktural minimum glandula submandibularis. Oleh karena itu, model ini tidak dapat digunakan untuk penuaan glandula submandibularis.

Kata kunci: penuaan, glandula submandibularis, *trimethyltin*, *point-sampled intercept*

## ABSTRACT

**Background.** Oral health problems in elderly people are associated with aging submandibular glands. Trimethyltin causes degeneration that mimics aging in many organs of the rodent model. This chemical has potential to be employed as a model of submandibular glands aging.

**Objectives.** This study aimed to estimate the mean volume of acini and identify glandular atrophy, acinar atrophy, granular convoluted ducts atrophy, intercalated ducts hyperplasia, and excretory periductal fibrosis of trimethyltin-induced aging model rats using single dose injection 8 mg/kg body weight intraperitoneally.

**Methods.** Twelve 3-month-old Sprague-Dawley male rats were divided into two groups. A single dose of trimethyltin chloride 8 mg/kg body weight was injected intraperitoneally on the 1<sup>st</sup> day of the study. The body weights of the rats were measured on the 7<sup>th</sup>, 14<sup>th</sup>, 21<sup>st</sup>, and 28<sup>th</sup> day. All rats were sacrificed on the 28<sup>th</sup> day. The submandibular glands were weighed and sectioned randomly and systematically using orientators to get the isotropic uniform random samples. The mean volume of acini was estimated by a point-sampled intercept method. Granular convoluted ducts atrophy, intercalated ducts hyperplasia, and excretory periductal fibrosis were assessed qualitatively.

**Results.** Weight loss in the first week upon trimethyltin injection was found in 3 out of six rats. The rest of the trimethyltin group has increased body weight less than the increased body weight of the normal control. The mean volume of submandibular gland acini of trimethyltin-induced rats group was not significantly different with control group, i.e.  $58882,60 \pm 11577,10 \mu\text{m}^3$  with  $58366,20 \pm 18832,55 \mu\text{m}^3$  ( $p = 0,956$ ). There was no difference of histological profiles of acini, intercalated ducts, and excretory ducts between two groups. Three out of six rats of the trimethyltin group showed epithelial cellular damage of granular convoluted ducts.

**Conclusion.** Rats injected with a single dose of trimethyltin 8 mg/kg body weight intraperitoneally only showed minimum damage and structural alteration of submandibular glands. Therefore, it can not be used as an aging model of submandibular glands.

Keywords: aging, submandibular glands, trimethyltin, point-sampled intercept