SUMMARY

The present study was carried out on the submandibular gland of 208 male albino rats of different ages to study the effect of testosterone and thyroxine hormones singly and combined on the glandular development.

They are devided into 7 groups, each group consists of :-

- 5 animals act as a control.
- 9 animals were injected with hormones solvents.
- 5 animals were injected with testosterone hormone.
- 5 animals were injected with thyroxine hormone.
- 5 animals were injected with testosterone and thyroxine hormones.

Paraffin and cryostat frozen sections were prepared to study the histological and histochemical parameters of the gland in addition to the quantitative measurements to reveal the postnatal changes occurring in the different components of the glandular parenchyma.

The results revealed that the postnatal development was divided into 2 phases; an acinar phase and a ductal phase.

The acinar phase began from birth to the age of 6 weeks while the ductal phase commenced thenceafter. The acini once formed had a constant size and nearly constant

functions; However, the ductal segments showed a steady increase in size and morphological change from birth to the third month. The granular convoluted tubules were the main structures affected by the age factor and the hormonal influences.

Administration of testosterone failed to accelerate the formation of acini or precocious appearance of granular convoluted tubules at the age period below 6 weeks. This observation was attributed to the lack of the specific androgen receptors in the early postnatal period of glandular development. After this age the hormone did induce increaseof diameters of granular convoluted tubule and in the number of their coarse granules but it failed to change the diameters of both acini and striated ducts.

Administration of thyroxine to the developing rats accelerated the differentiation of acinus cells and induce premature appearance of granular convoluted tubule cells (differentiated from striated ductal cells) at the age of 4 weeks.

Synergistically, the combination of the 2 hormones augmented the influence of either hormone solely; a notation which could be attributed to the possibility that thyroxine might activate the androgen receptors.

Histochemically; the activity of alkaline phosphatase, adenosine triphosphatase and succinic dehydrogenase enzymes were increased after thyroxine administration while testosterone had no effect on enzymatic activities.

The increase in enzymatic activities were collectively pointing to increased cellular activities indowed with active transport through cell membranes to and out the cells.

In conclusion, the present investigation revealed that the submandibular gland of rat was not completely developed at birth as regards storma and parenchyma, also the glandular development was noticed to be under hormonal control with special reference to the activities of granular convoluted tubular segment.