The effect of phenobarbital sodium on the The Thyroid Gland in Rabbits

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Abstract

The present study was design to observe the effect of Phenobarbital sodium on the thyroid gland of rabbits. A dose of(75mg/kg) was injected intramuscularly to the rabbits for (17) days. The study revealed a histological changes include decrease in follicular size and a major decrease in size of the follicular lumen.

Keywords: Phenobarbital sodium, thyroid gland, Rabbits

Introduction

Antiepleptic are found in several different chemical classes, barbiturates and oxazolidinediones. Barbiturates are antiepileptic drugs in which undergo extensive biotransformation in the liver. In which inactive hydroxylated products are formed and then conjugated with glucuronic acid before elimination by the Kidneys[1]Phenobarbital (PB) may produce additive central nervous system depression when administered concomitantly with alcohol analgesic. The antithyroid activity of certain barbiturates have been known since 1973 when [2]reported the inhibition of thyroid functions by thiobarbituric acids. Also[3]observed the effect of inducers of drug metabolizig enzymes. It has been found that some pharmacologicaly active barbiturates specifically promote carcinogenesis in certain epithelia[4] & [5]. Numerous side effects have been attributed anticonvnlsants medication. The present study is concerend with the histological changes in the thyroid gland.

Materials and Methods

Ten rabbits weighing between (500_1000 gr) were employed in this study, the animals were divided into two groups, control groups of five animals and treatment group the latter was given daily (75 mg/kg)[6] of phenobarbiltal sodium intramuscularly for (17) days. On the (18) day the animals were anaesthetized. Thyroid gland was remove and placed in Boin's fixative overnight and was processed for paraffain wax embedding and sectioning with hematoxylin and eosin according to[7] & [8].

Results

Rabbits treate with (75 mg/kg) of Phenobarbital sodium induced obvious thyroid atrophy compared with the control fig (1) this atrophy charactenzed by a slight decreasc in follicular size and a major decrease in the size of follicular lumen fig (2).

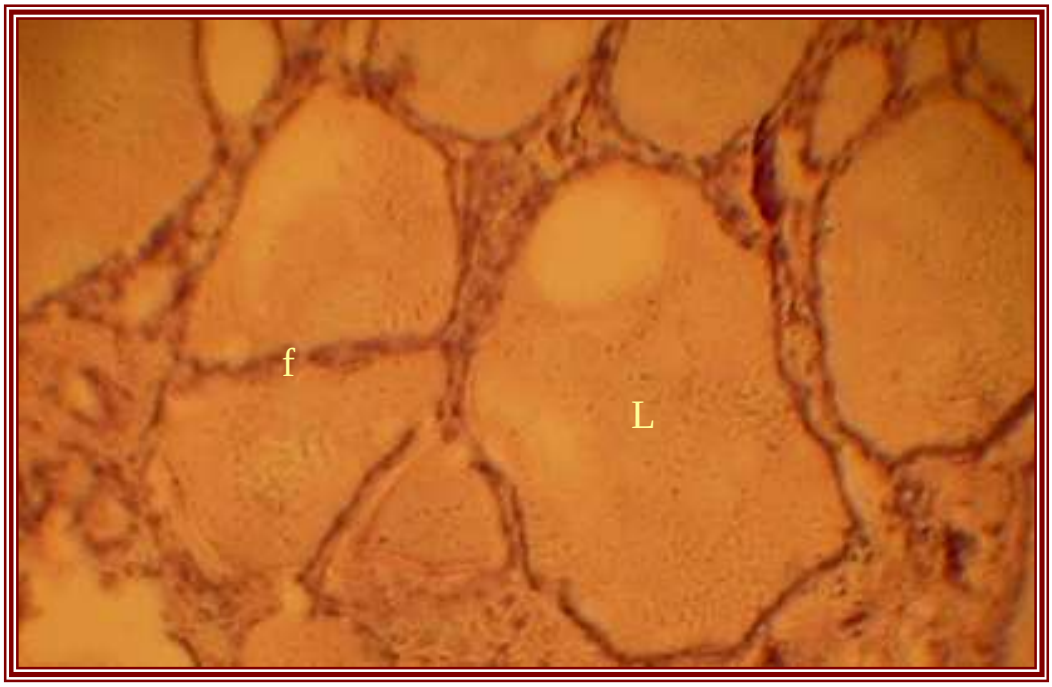

Fig (1):-cross Section in thyroid gland of control rabbits , large size follicular lumen (L) and follicular cells (f) (400X).

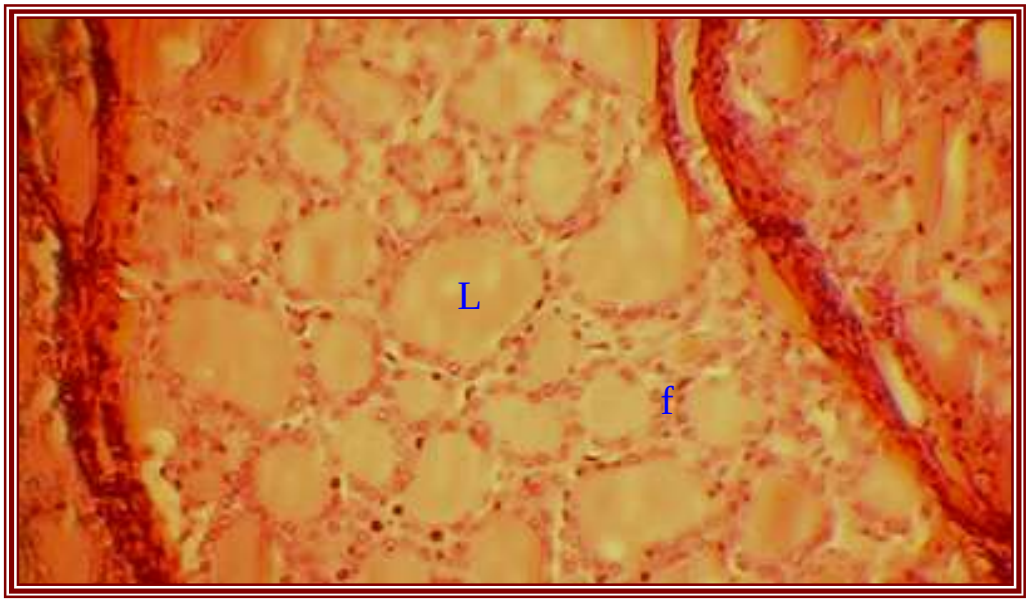

Fig (2):-cross Section of Thyroid gland in phenoparbital sodium treaed rabbit, show decrease in follicular lumen size (L) and amajor decrease in the size of follicular cells (f) (400).

Discussion

Thyroid hormones play an important role in the development of the fetus and later are involved in the general metaboliom. The circunlating thyroid hormone levels are maintained under strict control by Thyroid Stimulating Hormone (TSH) [9]. Several investigators concluded that the effects of Phenobarbital on the thyroid gland functions appeared to be primarily the result of effects on various aspects of thyroxin disposition[10]. A dose of (75mg/kg) of Phenobarbital sodium induced obvious thyroid atrophy characterized by a slight decreased in follicular size. The histological changes could be due to high secretion of (TSH) from the pituitary gland [11].

The mechanism involved alteration in the thyroid hormone synthesis, metabolism and displacement from serum proteins and effect on the hypothalamic and pituitary regulation of (TSH).

Also the effect of (PB) on hepatic disposition of thyroid gland through the induction of thyroxin glucuronyle transferase which appears to play an important role in the metabolism increasing and excrection of thyroxin [12] , [13] and [14]. Another reason is by decreasing the concentration ratio of tyrosine which is aprecursor of thyroid hormones [15]. Finally use of drugs which often beigns at infancy and throughout life must be used with care since they can cause an immense loss especially in children regarding their physical and mental growth.

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تأثير فينوباربيتون الصوديوم على الغده الدرقيه للأرانب

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الخلاصة:

أجريت الدراسة الحالية لهدف ملاحظة تأثير فينوباريتون الصوديوم على أنسجة الغدة الدرقية للأرانب. أعطيت جرعة (75ملغم/كغم) في العضلة لمدة سبعة عشر يوماً تبين من نتائج الدراسة انخفاض قليل في حجم الخلايا الحويصلية مع تضييق كبير في حجم التجويف الحويصلي.