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Effect of Cerastes Cerastes Venom on Thymus, Thyroid and Parathyroid Glands of the chick Embryo With reference to hadith of prophet Mohamed: kill the snakes

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Abstract: Objective: The effect of *Cerastes cerastes* venom on the chick embryo. **Material and Methods**: 80Dokky 4 fertile eggs were used in this study. The eggs were divided into two groups A & B. Group A contained 20 eggs as control and group B contained 60 eggs that were injected with sub lethal dose of crude fresh snake venom on the 15th day of incubation. The embryos were all extracted at 15 days of incubation after one hour of envenom injection. **Results**: The embryos treated with sub lethal dose were 40% dead. The living embryos treated with sub lethal dose had sever hemolysis externally with sluggish movement, the thymus had irregular cell arrangement in the stroma and ruptured ,mast cells- The parenchyma had excess lymphocytes in the cortex and less cells in the medulla. Epitheliocytes were prominent in the medulla. Wide spaces in the parenchyma were noted. The thyroid gland had ruptured cell cords, excess vesicular appearance of the ill-defined cells, and wide empty spaces. The Para thyroid gland had ill-defined cells with smaller nuclei and damaged cytoplasm. Irregular cell arrangements and wide spaces between the tissues were noted. **Conclusion**: Sub lethal effect of the venom on the embryo was evident and the exposure of pregnant women to snake venom should be treated carefully and promptly. The research confirmed the truth of the hadith of the prophet Mohammed peace upon him who ordered to kill the rattle snakes.

حديث ابن عمر و أبي لبابة ، قال ابن عمر رضي الله عنه :أنه سمع النبي صلى الله عليه وسلم يخطب علي المنبر ،يقول:" أقتلوا الحيات ، واقتلوا ذا الطفتين والأبتر، فإنهما يطمسان البصر و يسقطان الحبل "..

قال عبد الله: فبينما أنا أطارد حية لأقتلها فناداني أبو لبابة لا تقتلها .فقلت:إن رسول الله صلى الله عليه وسلم قد أمر بقتل الحيات.قال إنه نهي نعد ذلك عن ذوات البيوت، وهي العوامر.

أخرجه البخاري في : 59 – كتاب بدء الخلق: 79 – باب قول الله تعالي وبث فيها من كل دابة

– حديث عبد الله بن مسعود،قال:بينما نحن مع رسول الله صلى الله عليه وسلم في غار ،إذ أنزلت عليه – والمرسلات- فتلقيناها من فيه .وإن فاه لرطب بها ،إذ خرجت حية فقال رسول الله صلى الله عليه وسلم : "عليكم اقتلوها" قال :فابتدرناها فسبقتنا.قال :فقال:وقيت شركم كما وقيتم شرها.

أخرجه البخاري في 65 – كتاب التفسير : 77 –سورة والمرسلات:1- باب حدثني محمود.

[Manal G. Abd El Wahab, Sawsan G. Abd El Wahab, Huda G. Abd El Wahab, Amany Abd Elmoaty Mohamed Bayoumy**. Effect of Cerastes Cerastes Venom on Thymus, Thyroid and Parathyroid Glands of the chick – Embryo.** *Nat Sci* 2025,23(10):17-26]. ISSN 1545-0740 (print); ISSN 2375-7167 (online). http://www.sciencepub.net/nature 04. doi:10.7537/marsnsj231025.04

Key words: Cerastes Cerastes Venom; Thymus; Thyroid and Parathyroid Glands of the chick -Hadith kill the snakes

held (Warrell 1986; Proby et al., 1990; Mohiuddin et al., 1993; Clavert and Gabriel-Robez 1971, 1974; Mohamed and Nawar 1975c; Warrell 1986; Proby et al., 1990; Mohiuddin et al, 1993) .*Cerastes cerastes*, *Cerastes vipera*, *Echis Carindus* and *Echis coloratu* (El Hessy 1985).

Viperidae: Cerastes cerastes species was characterized by the presence of rattle (Tu 1982) although some species had no rattle.

There were five families of the toxic snakes according to the scientist classifications; Colubridae, Elapidae, Viperidae, Crolalidae and Hydrophidae,

1. Introduction

The review of literature showed that many workers studied the effect of venom snakes (Githens and Wolff 1940), Hoge (1965), Hoge and Romano (1971), Conant (1975), Harris and Simmons (1977) Cambell and Armstrong (1979) and Tu (1982). However, there were few studies on the effect of snake venom on the embryos and fetuses (Ruch and Gabriel-Robez 1962, Clavert and Gabriel-Robez 1971, 1974; Mohamed and Nawar 1975c).

Researches on pathological, immune and chemical effects on snake venom on human were

Method of venom collection and dose calculation: Milking or venom extraction technique was done by two techniques (Tu 1982).

(I) The manual extraction technique using finger pressure applied to the venom glands to more or less forcibly milk out the venom.

(2) Voluntary extraction technique was used also the snake was allowed to bite, number of times, into a rubber covered small glass; expressing venom voluntarily.

The snake was adult male and was restrained by the hands of snake trainer. In vivo, toxicity was determined in laboratories of Anatomy Department, Faculty of Medicine, Al-Azhar University. Cairo Egypt. Fertile fertilized eggs of the same-6 gm weight were divided into groups of six eggs each. They were injected by gradually increasing doses of the venom. The doses were increased in 0.05 mg steps until 100% mortality was obtained with the highest dose and no mortality with the lowest dose. All deaths within 24 hours after injection were ascribed to venom toxicity. The 50% lethal dose LD5O was $2.3x10^6$mg/embryo calculated by (lie method of Emery and Russell (1963) and expressed as milligrams of venom per-kilogram body weight of the experimental animal. The crude fresh venom solution used for the experimental embryos was for the sub lethal dose was 1..4x 10mg/embryo (Rush and Gabriel Robez 1962; Emery and Ru; 1963)

- (LD5O) 0.13 to 12.6 mg/kg intravenously
- intraperitoneally0.09-0. 7mg/kg

0 . mg/kg subcutaneously0.28- 0.3

(LD5O) venom in the present work 2.3x10mg /embryo The calculated

dose from the venom in the present work was 1.4x10mg for each embryo

according to Emery and Ru; 1963)

3. Results

A. Morphologic Results:

40% of the embryos treated by the sub lethal dose of the venom were dead.

All the embryos had severe hemolysis externally and the movement of the living embryos were sluggish

B. Histological

Histological examination of the thymus of 15 control embryo:

General examination of by H&E and toluidine blue stains of parts of TS in upper thorax of chick embryo at age of 15 days control showed the relation of Thymus gland) parathyroid) thyroid and internal jugular vein. Figs(1 -3) Thymus gland of control 15days control chick embryo was formed of incomplete lobules separated by septa ,The lobule was formed of densely packed lymphocytes and had less impacted medulla with lymphocytes,. The

there were two families in Africa: The Elapidae and the Viperidae were. One family was found in EYGPT. Viper; Cerastes cerastes, Cerastes vipera, Echis Carindus and Echis coloratu, (El Hessy, 1985).

Cerastes cerastes specie was characterized by the presence of projecting skales above the eyes rattles

The color of *Cerastes cerastes* was light brown, they had an apparatus.in which Venom extrusion was through the venom apparatus with which they inflicted wounds (Tu, 1982)

Rattle snakes varied in both the yield and lethal toxicity of their venoms, snake venom was composed of mixed complicated proteins which were neurotoxins and cardio toxins. All rattle snakes were a potential hazard to man (Tu, 1 982).

Venom lethal toxicity data had been reported only on 35 of the 76 rattle snake taxa .

It was reported that *C. viridis* had more toxic effects in adult age, geographic places and weather affected the type and potency of the venom. *C.*viperidi had the venom apparatus in the head and they were similar to other species (Kochva and Gans 1966; Kochva, l978)

Warrell 1986 mentioned that risks and lethal hazards were more in county side, and the farms where snakes were present in large numbers. .

There were few studies on the Effect of *Cerastes cerastes* venom on thymus, thyroid and parathyroid glands of the chick embryo

The aim of the work is to study the Effect of *Cerastes cerastes* venom on thymus, thyroid and Parathyroid Glands of the chick Embryo to find out the effect on human embryos if the mother was infected by snake bite and their venom

2. Material and method:

80Doky4 fertilized eggs were used and divided into2 groups: The first group: 20eggsas control group. The eggs were opened in the day15th of incubation. The second group was divided into A&B groups. Group A consisted of 40 eggs were injected with venom snake incubated and opened after one hour of incubation Group B consisted of 40 eggs were injected by saline by two hole method (Allam et al.,1976).The eggs were incubated under standard conditions of humidity and temperature in electrical incubators.

The specimens were fixed in formalin 10%for 10days then put in paraffin wax, and then sections were prepared for histological examination by light microscope after cutting at 8micron thickness by the microtome. Suitable stains were used.

Heamatoxylin and eosin, Masson trichrom, and Toluidine blue Drurry and Wallington (1980):

that parathyroid were nonfunctional in embryonic period .

In the present work 40% of the embryos treated by the sub lethal dose of the venom were dead after one hour of venom injection.. All the embryos had severe hemolysis externally and the movement of the living embryos were sluggish,There was massive bleeding after one hour after venom injection of cerastus cerastus that might be due to the direct effect of the venom and neurotoxic ,besides cardiac toxicity on the heart. The results of the present work agreed with **Brazile, 1972; Breithaupt, 1976**. However, the workers thought that the influence of venom was in secondary and direct due to the effects on the cardiovascular system CVS. Meanwhile other investigators believed then the venom effects were due to neurotoxic, respiratory toxicity and the destructive effects on CVS and the collapse of the mechanism of stop bleeding **(Hasiba et al., 1975 Clement and Pietrusko l979; Ruizetal., 1980**). The true cause of death from venom was unknown, but most probably was due to complicated complex effects on nerve endings and respiratory muscles, besides circulatory toxicity and collapse **(Gopal-akrishna kone et al., 1980**) and (**Tu** 1982)

In the present work there was sever lysis of RBCs and hemolysis after one hour from venom injection to chick embryos ,that might be due to direct and indirect effect of Rattlesnake

Snake venom that consisted of Elapid. However other species did not contain indirect hemolytic factors only (Rattlesnake Russell, 1960)

In the present work sever hemolysis was noted and destrictive effects on the thyroid gland , thymus and para thyroid glands after one hour after venom injection , that results coincided with other workers who noted hemolysis from snake bites to various specious on animal experimental studies, from crotaline venom **Taube and Essex(1937).**

- . **Witham et al. (1953)** horridus venom .
- **Russel et, al ,.1992**
- **Carlson et al .,1975., Schaeffer et al., 1976, 1978.,1979 a,b),** who noted hemolysis in **diaphragm. .and peritoneum,**
- **Schaeffer et al, 1978, 1979a,b; Ruiz a al., 1980 reported** hemolysis in **inter costal muscles (Carlson et al., 1975; Schaeffer et a)., 1978, 1979),**
- **the results of the present work agreed with Schaeffer et al., 1976, 1978, 1979 a,b),** who reported that hemolysis from snake venom in ; the intestine
- and at the apex of the left ventricle (**Schaeffer e al., 1978t Ruiz et al. (1980**mentioned hemolysis in in spleen and

capsule was formed of stroma and parenchyma, surrounded the incomplete lobules, fibroblasts, lymphocytes, epitheliocytes could be noted and blood cells .some mast cells in addition to collagen seen by Masson trichrom stain could be seen between thyme tissue and in their septa Figs (4-7)

Histological examination of the thymus gland of 15 days treated embryo (Figs 8-12)

Histological examination of the thymus gland of 15 days treated. Embryo showed that the thymus gland had Spaces between thymus lobules besides damaged cells with .vacuolar cytoplasm and extensive lymphocyte, separated septa with lymphocytes, dense cortex ruptured mast cells were present between wide spaces , wide spaces, between irregular cells (Figs 11&12)

Thyroid gland of 15 days control embryos Figs.(1& 13)

Histological examination of part of the thyroid gland of 15 days control embryo showed the relation of the gland in upper thorax with the thyroid gland ,and internal jugular vein (fig 1) and showed that the gland was formed of thick intact **cords only ,there were no acini .**

Thyroid gland of 15 days treated embryos figs 14-16

Histological examination of the thyroid gland of 15 days treated embryos, showed the presence of thick non intact cords forming ruptured tissue

Separated spaces were noted.

ParaThyroid gland of 15 days control Embryo Figs(1&17.

Histological examination of part of TS of the para thyroid gland of 15 days control embryo showed the relation of the gland in upper thorax with the thymus and thyroid gland (fig 1).The gland was formed of thick intact cords only and there were no,acini or vesicles

Parathyroid gland of 15 days treated embryos (Fig, 18)

Histological examination of part of TS of the para thyroid gland of 15 days treated embryo showed separated spaces and ruptured tissue Fig,18:

4. Discussion

In the present work was an anatomic relation between thymus, thyroid and parathyroid glands That agreed with Romanoff (1960) who mentioned that thymus, thyroid and parathyroid glands derived from the third and fourth pharyngeal pouches. Thus they were endodermal in origin. Parathyroid glands situated posterior to the thyroid gland and were formed of cords only and there were no,acini or vesicles and that coincided with Romanoff 1960 who concluded

thyroid follicles and were larger. Para thyroid glands were 4glands and located in the back of thyroid gland.

Conclusion:

Sub lethal effect of the rattle snake **Cerastes Cerastes** venom on the chick embryo was evident and that could happen to human, the exposure of pregnant women to snake venom should be treated carefully and promptly. The research emphasized the truth of the hadith of the prophet Mohammed peace upon him who ordered to kill the rattle snake **Cerastes Cerastes** snakes for their harm /prophet peace be upon him, must be inspired from Allah the most merciful suret Alnajm (3&4).

حديث ابن عمر و أبي لبابة ، قال ابن عمر رضي الله عنه :أنه سمع النبي صلى الله عليه وسلم يخطب علي المنبر ،يقول:" أقتلوا الحيات ، واقتلوا ذا الطفتين والأبتر، فإنهما يطمسان البصر و يسقطان الحبل .."

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جاء في كتاب الجامع الصحيح المسمي صحيح مسلم للإمام ابن مسلم النيسابوري

■اخبرني سالم عن عبد الله عن ابن عمر قال سمعت رسول الله صلي الله عليه وسلم (يقول اقتلوا الحيات والكلاب واقتلوا ذا الطفتين والأبتر فإنهما يلتمسان البصر و يسقطان الحبالي) قال الزهري نري ذلك من سميهما والله أعلم.

جاء في المنتقي من أخبار المصطفي صلي الله عليه وسلم لابن تيمية

■ (باب في أن قتل الحية ،والعقرب ،والمشي اليسير في الصلاة للحاجة لا يكره)

عن أبي هريرة أن النبي صلي الله عليه وآله وسلم أمر بقتل الأسودين في الصلاة : العقرب ، والحية .رواه الخمسة وصححه الترمذي . – حديث عبد الله بن مسعود،قال:بينما نحن مع رسول الله صلى الله عليه وسلم في غار ،إذ أنزلت عليه – **والمرسلات**- فتلقيناها من فيه .وإن فاه لرطب بها ،إذ خرجت حية فقال رسول الله صلى الله عليه وسلم : **"عليكم اقتلوها" قال :فابتدرناها فسبقتنا.قال :فقال:وقيت شركم كما وقيتم شرها.**

■ أخرجه البخاري في 65 – كتاب التفسير : 77 –سورة **والمرسلات:1**- باب

بسنده عن عائشة رضي الله عنها زوج النبي (ص) عن النبي صلي الله عليه وسلم أنه قال خمس فواسق يقتلن في الحل والحرم **الحية** والغراب الأبقع والفأرة والكلب

– مختار الصحاح: (الأبتر ، ثعبان،حية)

ب ت ر-(بتره) قطعه قبل ألإتمام وبابه نصر و(الإنبتار) الانقطاع و(ألأبتر) المقطوع الذنب وبابه طرب وفي الحديث""ما هذه البتيراء و(ألأبتر) أيضاً الذي لا عقب له وكل أمر انقطع من الخير أثره فهو(أبتر).

retro peritoneum)**Sabback , et al ,.1977 ; and Clement agreed with and Pietrusko, 1979**

- **Taube and Essex (1937)** who studied rattlesnake **(Homma and Tu 1971; Ownby et at., 1974; and Ownby (1975)**م reported C.atrox venoms r rhexis
- **Tu (1977)**(ISOLATED 5TYPES OF heamorrhagic toxins from the venom of the western diamond black rattlesnake C.atrox . **Tu (1982 mentioned that** diapedesis or per rhexis- in heamoahage by rhexis from the vascular wall, especially the endothelium was destroyed, where as in hemorrhage per diapedesis only the intercellular junctions were modified to allow blood components to escape .
- The results of present work, **agreed with el hessy 1985** who studied the venom of naja haje .and coincid**;(, (1960);** who found that the LD5O and the **sub lethal dose injected in pregnant rats caused hemolysis in kidney and peritoneum, (Zollinger (1966) and El Hessy, (1985** .(**Hamburger, et at., 1968** .(mentioned that the direct cause of the hemolytic effect of the snake venom were due to direct effect of the venom and oxygen insufficiency of the tissues and \the associated ischemia

The result of the present work agreed with Mestecher (2024) who mentioned that thyroid gland was formed of millions of thyroid follicles which had a central Lumina filled with gelatinous acidophil colloid .Thyroid gland secreted triiodothyroninT3 and tetra iodothyronineT4 and calcitonin. Chronic iodine, efficiency caused goiter. However Graves' disease was auto immune disease which increased the metabolic rate and caused weight loss. in which antibodies produced chronic stimulation to the follicular cells and released thyroid hormone hyper thyro-idism and other features. Meanwhile hypothyroidism was due to low thyroxin due to thyroid inflammation caused weight gain ,intolerance to cold intolerance, and decrease ability to concentration.

In the present work different stain affinity was noted in the thyroid and parathyroid gland tissue studied that might be to the nature of the secreted subjects.

The results of the present work were similar to Mestecher (2024) who mentioned that thyroid gland located anterior to the larynx and consisted of two lobes united by an isthmus. Thyroid gland Secreted T3and T4 and the para follicular cells present at thyroid base secreted calcitonin from c cells.

C cells were isolated clusters at were derived from the neural crest and had lighter stain than the

ث ع ب- (الثعبان) ضرب من الحيات طوال وجمعه (ثعابين)و(ثعبت)الماء فجرته و(الثعب)ميل الماء في الوادى وجمعه (ثعبان)

حية : تقال للذكر وألأنثي والهاء للإفراد كبطة ودجاجة، علي أنه روي عن العرب رأيت (حيا) علي (حية)أي ذكراً علي أنثي،وفلان حية أي ذكر.و(الحاوي) صاحب الحيات.

- ثعبان: ذكر مرتان في107 الأعراف-32 الشعراء.
- حية: 20 طه.

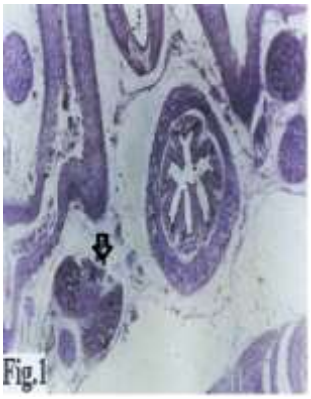

Fig1: photomicrograph of part of TS in upper thorax of chick embryo at age of 15 days from control showing the relation of thyroid.,thymus. and parathyroid glands , (arrow) HEx40

Fig2: photomicrograph of part of TS in upper thorax of chick embryo at age of 15 days from control showing part of the
, thymus gland(formed of incomplete lobules. Note the lower part of thymus gland with empty space between the two lobes (arrow) Toluidine blue x40

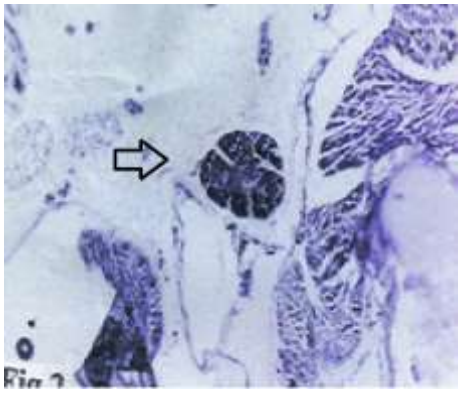

Fig3: photomicrograph of part of TS in upper thorax o control chick embryo at age of 15 days showing the relation of thyroid, thymus and parathyroid (arrow) HEx40, HE x40

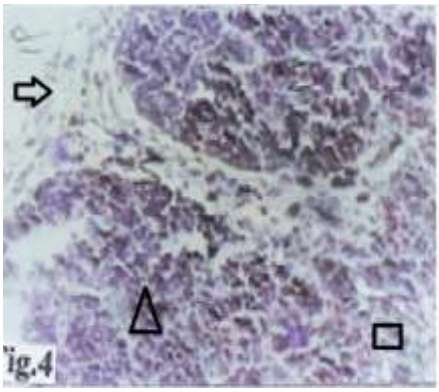

Fig4: photomicrograph of part of TS in upper thorax of chick embryo at age of 15 days from control showing part of the capsule (arrow)and septa full of lymphocytes, blood cells and fibroblasts Part of the outer cortex(arrowhead) and inner medulla (box)can be seen in some lobules H&E x400

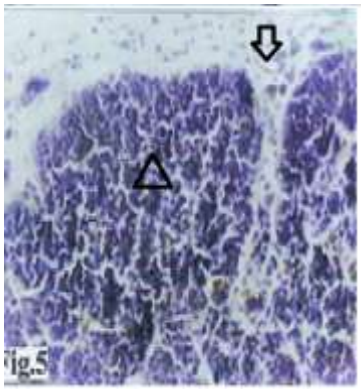

Fig5: photomicrograph of part of TS in upper thorax of control 15 days chick embryo showing part of the capsule,and septa (arrow) Stroma and parenchyma, (arrowhead)full of lymphocytes fibroblasts blood

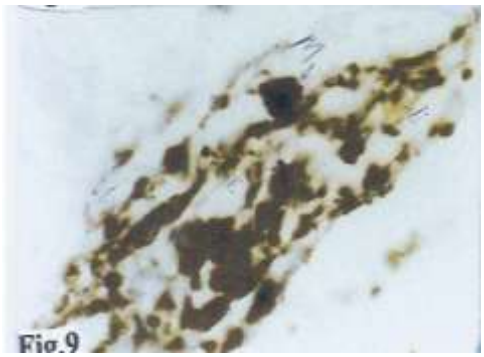

Fig9: photomicrograph of part of TS in upper thorax of treated 15 days chick embryo of thymus gland showing damaged condensed tissue, and wide spaces between. Cells with vacuolar cytoplasm and extensive lymphocyte.
Toluidine blue, X1000

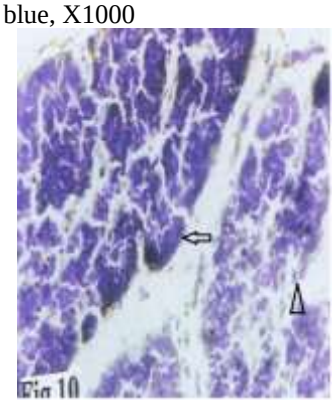

Fig10: photomicrograph of part of TS in upper thorax of 15 days treated chick embryo of thymus gland showing condensed tissue (arrow),separated relatively empty septa with lymphocytes, relatively empty medulla,(arrowhead) Masson trichrome, X x400

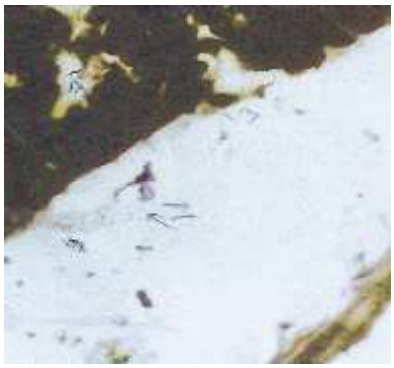

Fig11: photomicrograph of part of TS in upper thorax of 15 days treated chick embryo of thymus gland showing separated septa with lymphocytes, dense cortex ruptured mast cells are present. The stain affinity is changed .toluidine blue x400,

cells, collagen and epithiliocytes, Masson trichrome x400

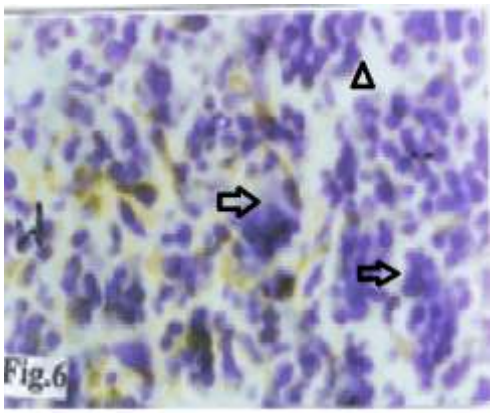

Fig6: photomicrograph of part of TS in upper thorax of control thymus gland 15 days' chick embryo showing epetheliocytes arranging in central arrangement.(arrow) between wide spaces.(arrow head) Masson trichrome X 100

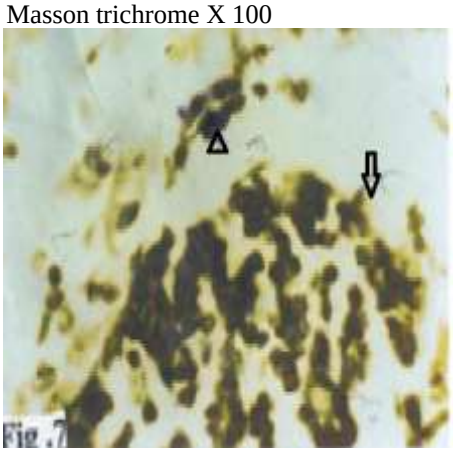

Fig7:photpmicrpgraph of part of TS in upper thorax of control thymus gland 15 days chick embryo showing epetheliocytes(arrow), lymphocytes and mast cells (arrowhead), Toluidine blue X 100

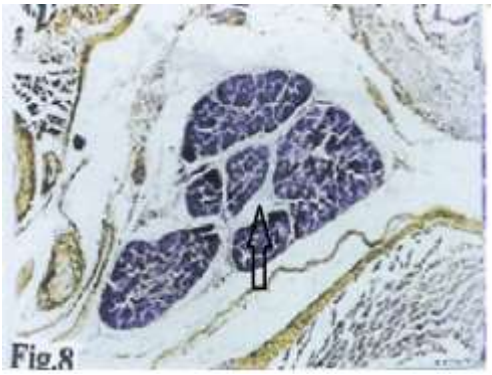

Fig8: photomicrograph of part of TS in upper thorax of treated 15 days chick embryo of thymus gland showing wide spaces between thymic lobules(arrow), Masson trichrome, X100

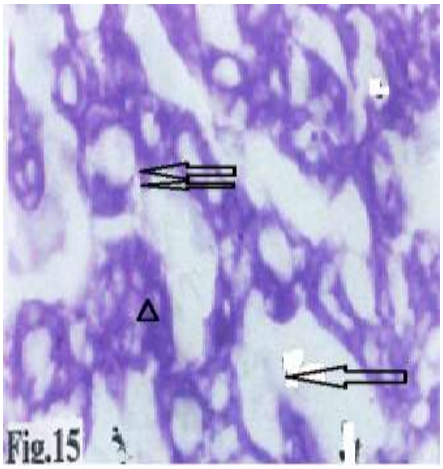

Fig15: photomicrograph of part of TS in upper thorax of 15 days treated chick embryo of thyroid glands gland showing wide separated spaces(arrow)and ruptured vesicles (double arrow) , . damaged ruptured cords and tissue are present)., Masson trichrome X 1000

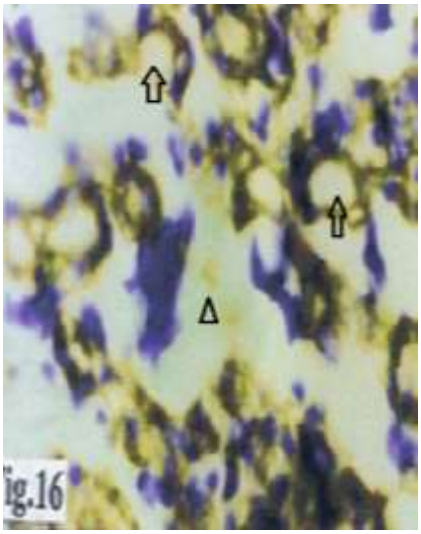

Fig16: photomicrograph of part of TS in upper thorax of 15 days treated chick embryo of thyroid glands gland showing separated spaces(arrowhead), ruptured vesicles (arrow) and damaged tissue,×Masson trichrome X 1000

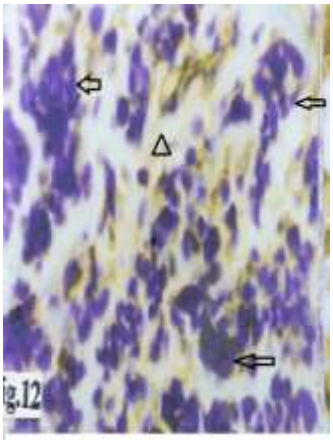

Fig12: photomicrograph of part of TS in upper thorax of 15 days treated chick embryo of thymus gland showing condensed tissue (arrow) separated septa (ARROWHEAD) with infiltrating lymphocytes, Masson trichrome, X 400

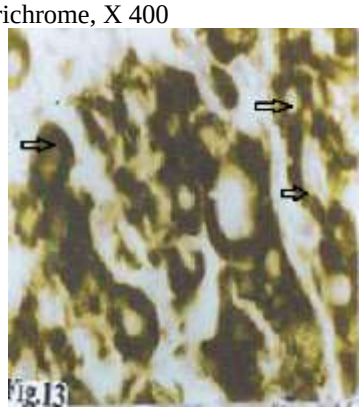

Fig13: photomicrograph of part of TS in upper thorax of 15 days control chick embryo of part of thyroid gland showing thick intact cords and follicles which central Lumina.some follicles have filled with colloid. (arrow), Toluidine blue X 1000

Fig14: photomicrograph of part of TS in upper thorax of 15 days treated chick embryo of thyroid glands gland showing separated spaces and ruptured tissue, Toluidine Blue x400,

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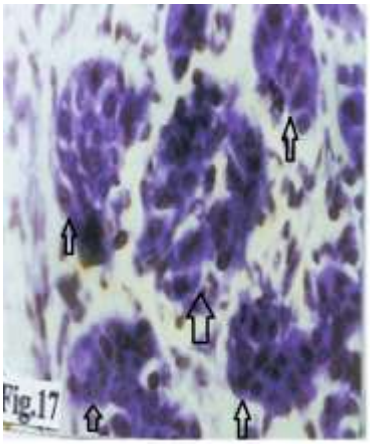
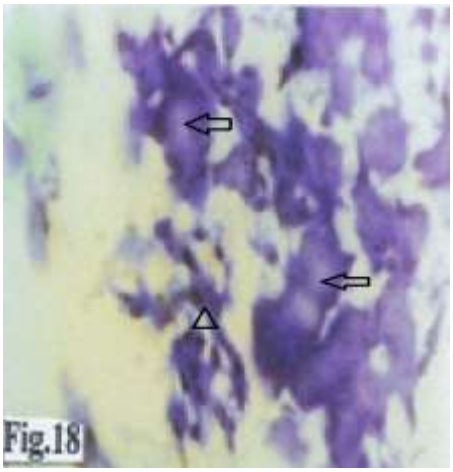


Fig17: photomicrograph of part of TS in upper thorax of part of TS of control para thyroid gland of 15 days chick embryo showing thick intact cords(arrow) cords only and there are no,acini or vesicles H&E X 1000



Fi18: photomicrograph of part of TS in upper thorax of 15 days treated chick embryo of, showing pat of para thyroid glands damaged follicles ,some are full of secretion (arrow)showing separated spaces and ruptured condensed tissue(arrowhead) H&E X 1000

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