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Identification Immunohistological Changes In Spleen In Meales And Females Rats With Endocrine Glands Disorder

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Abstract:

The term "endocrine disorders" refers to a collection of conditions that are caused by issues that occur in a portion of the endocrine system.It is possible for these illnesses to manifest themselves when the endocrine system creates an excessive amount or an insufficient amount of a hormone, or when the body does not react appropriately to the hormone.It is the purpose of this study to investigate the impact that endocrine abnormalities have on the spleens of both male and female laboratory rats.The rats, totaling twenty-four, were divided into three groups.(G 1), which consisted of eight rats (four males and four females), a normal saline solution was administered to them for a period of twenty-one days.) (G 2), which consisted of eight male rats, metoclopramide was administered intraperitoneally at a dose of 0.6 mg ø kg on a daily basis for a period of 21 days in order to induce hyperprolactinemia.(G 3), which consisted of eight female rats, metoclopramid was administered intraperitoneally at a dose of 0.6 mg ø kg. This was done in order to induce hyperprolactinemia for a period of 21 days. Following the conclusion of the trial, which lasted for 21 days, a number of blod parameters were evaluated, and the proportion of the hormone prolactin was evaluated.Subsequent to the resection of the spleen, the three groups were separated into their respective groups.Hematoxylin, eosin, and masson stain were used throughout the process of sectioning and staining the tissue. the study demonstrated a noteworthy rise ($p<0.05$) in the concentration of the hormone prolactin among the male and female group as compared to the control group.Upon histological inspection of the spleen, it was observed that there was a discernible alteration. It is important to note that the white pulp increased region covered around fifty percent of the spleen area in comparison to the red pulp area.The germi centre of the secondary and lymph follicle was observed; however, as compared to the control, we saw that the white pulp region was reduced. Furthermore, the secondary follicle, which is the active follice, was not observed.It is concluded from this that endocrine disorder have a clear effect on the tissue immune status of the spleen through the changes shown in the results of the current study.

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Key words : Indocrine disorder ,Spleen ,prolactin ,Hyperprolactinemia

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Introduction:

Hypogonadism, insulin-dependent diabetes, hypothyroidism, and hypoparathyroidism are all included in the category of endocrine disorders, which are a type of disorder that affects the glands that are responsible for producing hormones. Some hereditary hemolytic disorders are characterised by the presence of these issues, and it is imperative that these conditions be treated appropriately (1,2).Those who suffer from endocrine disorders can be classified according to the following categories: Initially, the issue arises when a gland produces an unusually high or low amount of a certain hormone, which happens when there is an imbalance in the levels of the hormones. This is the root cause of the problem. Furthermore, the disease is brought on by the formation of tumours in the endocrine system, which may or may not have an effect on the levels of hormones (3). This is another factor that contributes to the sickness.Among these illnesses is one that is referred to as hyperprolactinemia. This condition is distinguished by an increase in the quantity of prolactin that is present in the bloodstream as a result of a disease that takes place in the pituitary gland (4,5).The majority of cases of hyperprolactinemia are caused by the presence of tumours in the pituitary gland or by the use of specific drugs (6). Both of these factors are responsible for the accumulation of the hormone.Among the medications that have the potential to induce a rise in the quantity of prolactine that is discovered in the blood, metoclopramide is one of the medications that has this potential (7,8).What kind of medication is typically prescribed to patients in order to hasten the action of the digestive system and the emptying of the stomach?The chemical that is today known as metoclopramide was initially characterised by Jastin-Besaucon and Lavillen at the beginning of the year 1964 (9).Utilisation of this drug over an extended period of time may lead to hyperprolactinemia (10). The spleen is located in the left hypochondriac region of the abdomen, which is located between the fundus of the stomach and the diaphragm. This region is also known as the posterior portion of the abdomen. The length of it is roughly 12 centimetres, the breadth is approximately 7 centimetres, and the thickness is approximately 3 centimetres. It weighs somewhere between 150 and 250 grammes, and it measures approximately 3 centimetres in thickness. The hilus, which is a depressed area in the capsule, is the passageway through which the splenic nerve plexus, the splenic artery, the splenic vein, and the lymphatic arteries that carry efferent lymphatic fluid all pass [11, 12, 13]. It is an organ that not only makes effective use of its own immune cells, but also mobilises the immune cells of the body for the goal of immunological monitoring and protecting other vital organs including the heart, kidneys, and brain [14, 15, 16, 17]. The spleen is an organ that is responsible for both of these functions. Macrophages, monocytes, natural killer (NK) cells, black and white blood cells, and T cells are the cells that are accountable for a substantial amount of the functions that the spleen is responsible for wide range of immunological illnesses, including cancers, as well as physical injuries and infections (including cancer) can affect the spleen. The spleen is also very sensitive to these diseases.One of the key goals of the current research project is to acquire an understanding of the immunological changes that occur in the spleen as a result of endocrin illness.The present study aims to identify the immunohistological changes and some blood parameters of the spleen in males and females laboratory rats.

Materials and Methods :

The purchase included twelve mature males and twelve adult females, ranging in weight from roughly 190 to 234 grammes. Animals were kept in captivity. Upon placement, the rats were placed in a normal plastic cage, which was located in the animal house of the college of Education pure sciences at The Qar University. Each cage had four rats. The conditions in which they were housed were standard, with the temperature kept at room temperature and the natural sunshine rhythm being maintained. Ten days prior to the beginning of the experiment, the animals were held in order to acclimatise to the environment. In addition to a constant supply of water, they were provided with a

typical rat food (ad libitum).

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Experimental design:

In accordance with the following, the animals were randomly separated into three groups, with eight rats for each group:

Group 1 : Intraperitoneal injections of normal saline (N.S.) were administered for a period of twenty-one days within the negative control group.

Group 2 : A single dose of metoclopramide, 0.6 mg ø kg bwt, was administered to the animals in order to produce hypreprolactinemia. An injection of metoclopramide was administered to each rat on a daily basis for a period of (17). twenty-one days, as stated in reference.

Group 3 : The animals in the hyperprolactinemia female group were administered a single dose of metoclopramide, which was 0.6 mg ø kg bwt, in order to produce hypreprolactinemia. The dose was administered to the rats on a daily basis through injection for a period of twenty-one days, as stated in reference .(17)

Biochemical analysis:

Using commercial kits, the determination of serum prolactin was carried out by Alexandra.

Measurement of some blood parameters of laboratory rats.

The total number of WBC, RBC, PLT, HGB, MCV, and MON was counted for each and every group.

Histopathological study

After being fixed in a 10% formalin solution for forty-eight hours, samples of spleen were taken. After that, they were processed by being rinsed with water, going through increasing concentrations of ethyl alcohol, being cleaned in xylene, and being embedded in paraffin wax at a temperature of seventy degrees Celsius.On clean glass slides, five millimetres of tissue tissue was placed, and then it was stained with hematoxylin, eosin, and masson (18).

Statistical Analysis:

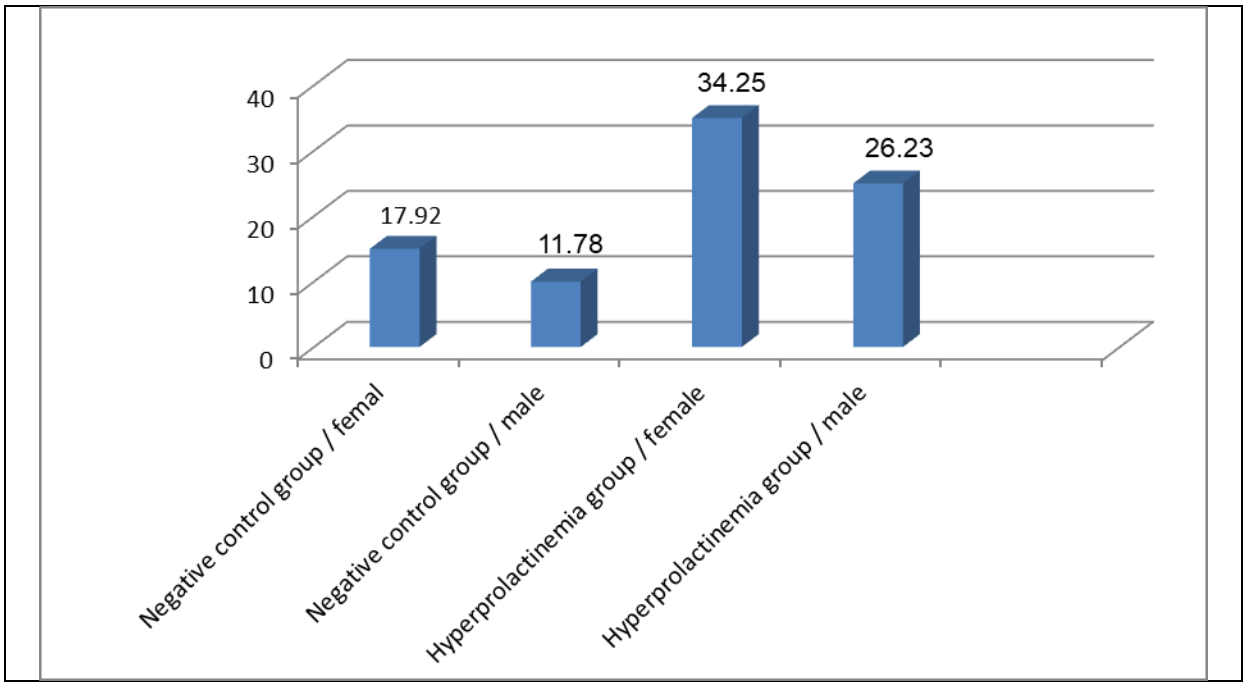
The outcomes of the current investigation were analysed by employing Tukey's test, which is a one-way analysis of variance (ANOVA) test, in every single study. The statistical software package known as SPSS V (developed by SPSS Inc.) was utilised in order to carry out all of the statistical calculations.The data were expressed as the mean plus the standard deviation, which is denoted as Mean plus SD (19).

Results :

Hormonal change :

When comparing the male group and the furniture group with the control group, the results of the current study showed that there is a significant increase in the level of the prolactin hormone, as shown in (Figure 1), on the one hand, and on the other hand, when comparing the hyperprolactinemia group for males, we find a significant decrease in comparison to the hyperprolactinemia group for females.

Figure 1 : prolactin hormone level in all groups



Measurement of some blood parameters of laboratory rats:

The entire number of all groups, including WBC, RBC, PLT, HGB, MCV, and MON, was counted.The findings of the current study demonstrated that there is a statistically significant rise in the two hyperprolactinemia groups for blood parameters represented by (WBC, RBC, and PLT) when compared with the control group, as shown in the figure (2,3,4), respectively. In addition, when a group of guys with hyperprolactinemia and a group of females with hyperprolactin were compared to one another. Take note of the fact that the male group has significantly increased in comparison to the female group.When compared with the control group, the results of the also demonstrated that there was a substantial rise in the group of hyperprolactinemia in (HGB,MCV,MON). This was likewise the case when comparing the hyperprolactinemia male group

with the hyperprolactinemia female group. In comparison to the female group, the male group had a fall in blood level that was statistically significant, as demonstrated in figures (5, 6, and 7 accordingly).

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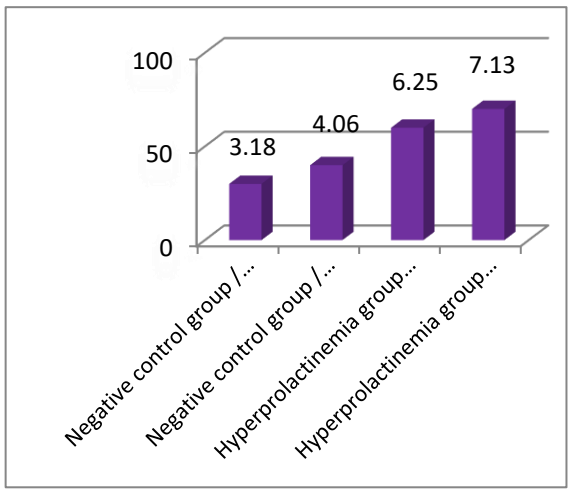
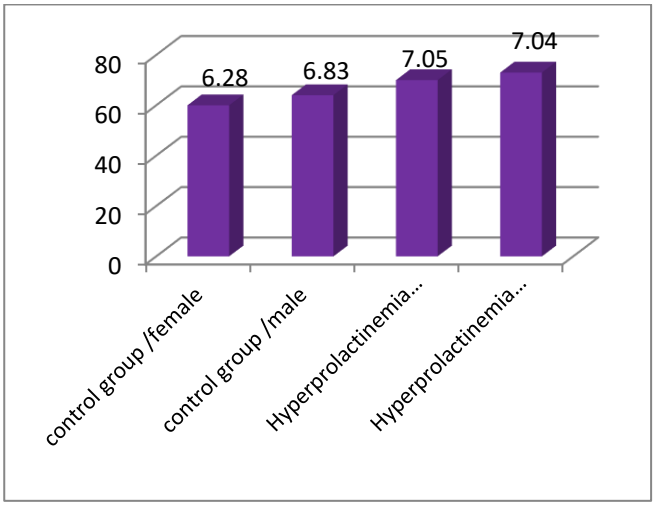
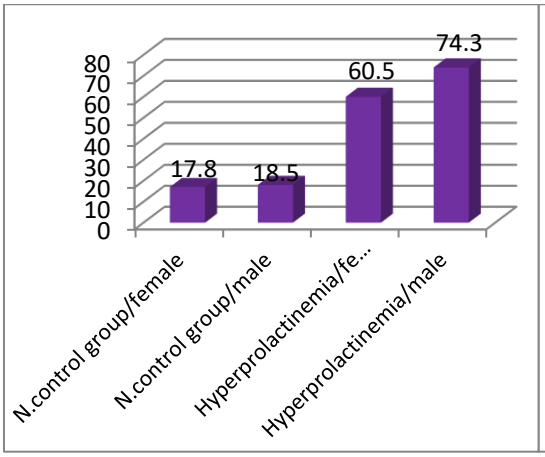


Figure (2) : White biood cells (WBC)



Figure(3) : Red biood cells (RBC)



Figure(4): Platelets (PLT)

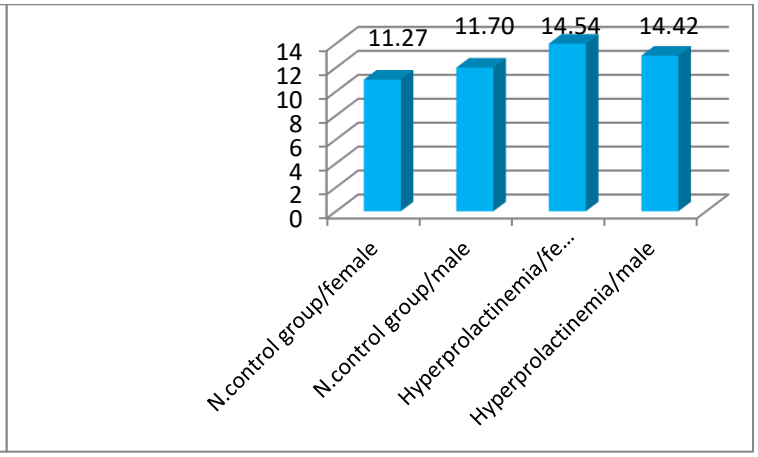
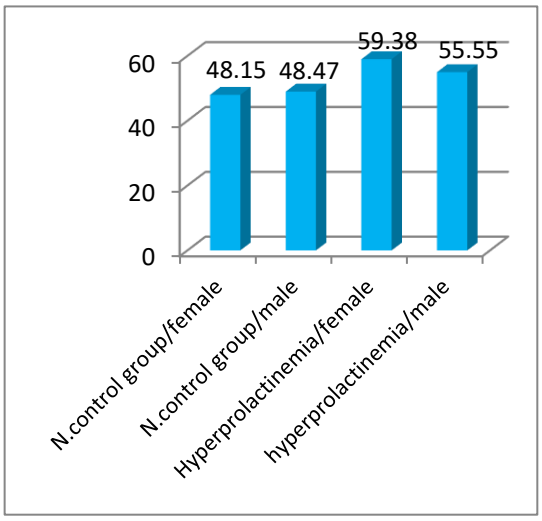


Figure (5):Hemoglobin (HGB)



Figure(6): Red blood cell size

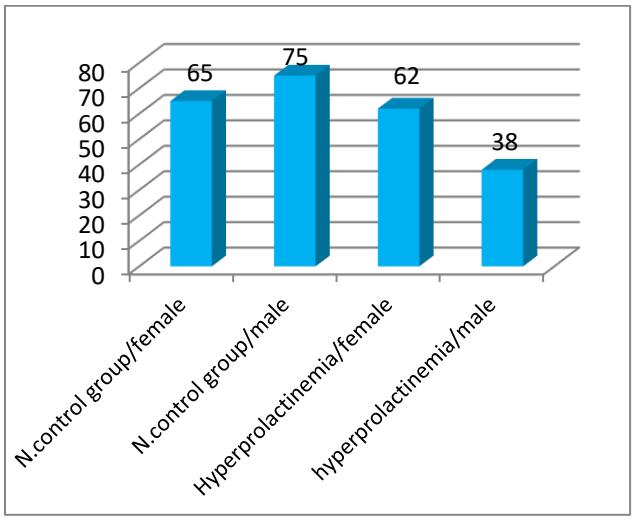
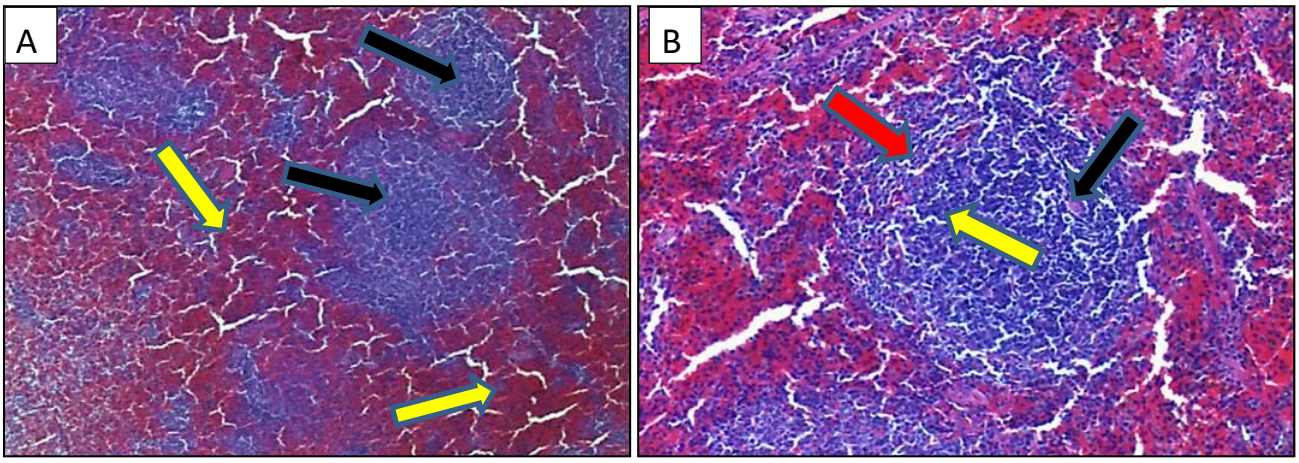


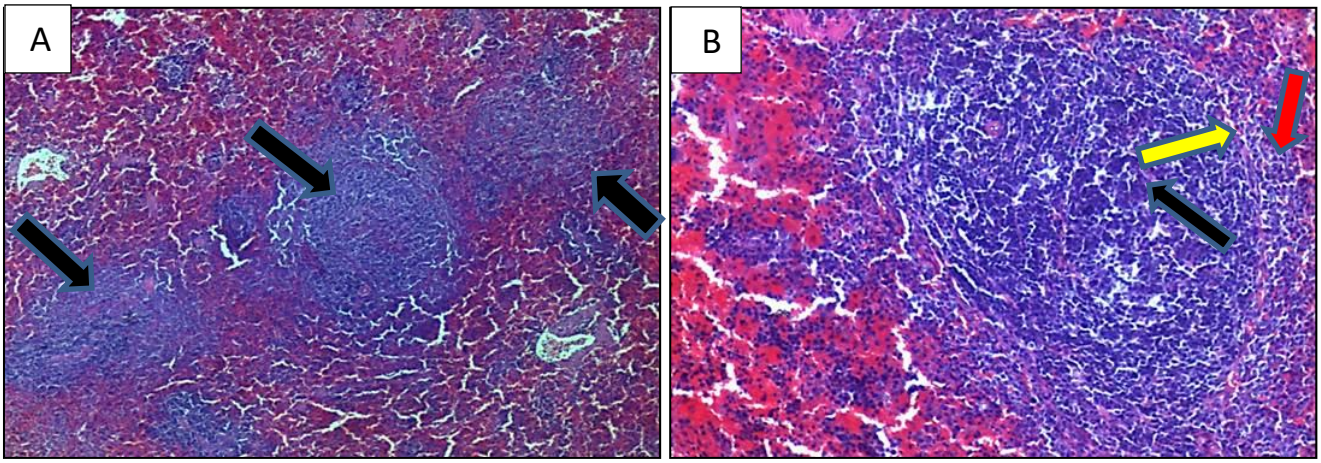
Figure (7): Monocytes

Histological study

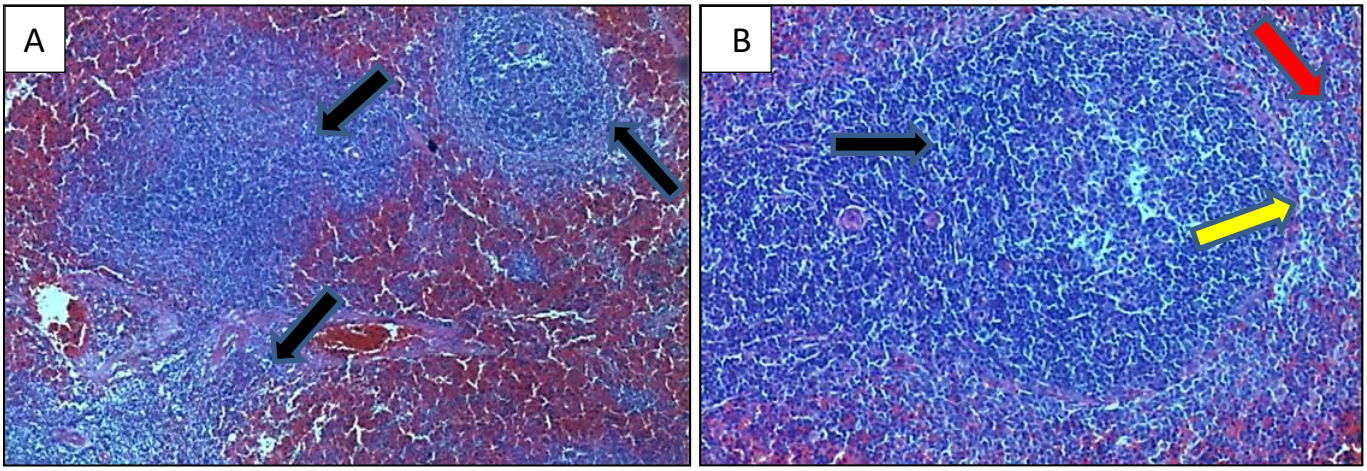
The results of the current study indicated the occurrence of histological changes in the spleen in hyperprolactinemia group compared with the control, Note the white pulp area increased covered about 50% of the spleen area compared with the red pulp area and rats showed there is marked hyperplasia of the white pulp tissue. The secondary lymph follicle germinal center was observed, note the active germinal center, the marginal zone, and the mental zone(Figure 8) .



Figure(8): Across section of the spleen tissue in the control group.**A/** Note the white pulp (black arrow) area was reduced compared with the red pulp (yellow arrow) area, where the white pulp area covered less than 30% of all spleen inspected area. **B/** The primary lymph follicle (black arrow) was observed, note the marginal zone (yellow arrow) and mental zone (red arrow). **H&E. A: 100x and B: 400x.**



Figure(8): Across section of the spleen tissue in the hyperprolactinemia males group **A/** Note the white pulp (black arrow) area covered more than 40% of the spleen area and hyperplasia of the white pulp compared with the red pulp (yellow arrow) area. **B/** The secondary lymph follicle germinal center was observed, note the active germinal center (black arrow), the marginal zone (yellow arrow), and the mental zone (red arrow). **H&E. A: 100x and B: 400x.**



Figure(8) :. Across section of the spleen tissue in the hyperprolactinemia females group **A/** Note the white pulp (black arrow) area covered about 50% of the spleen area and hyperplasia of the white pulp compared with the red pulp (yellow arrow) area. **B/** The secondary lymph follicle germinal center was observed, note the active germinal center (black arrow), the marginal zone (yellow arrow), and the mental zone (red arrow). **H&E. A: 100x and B: 400x.**

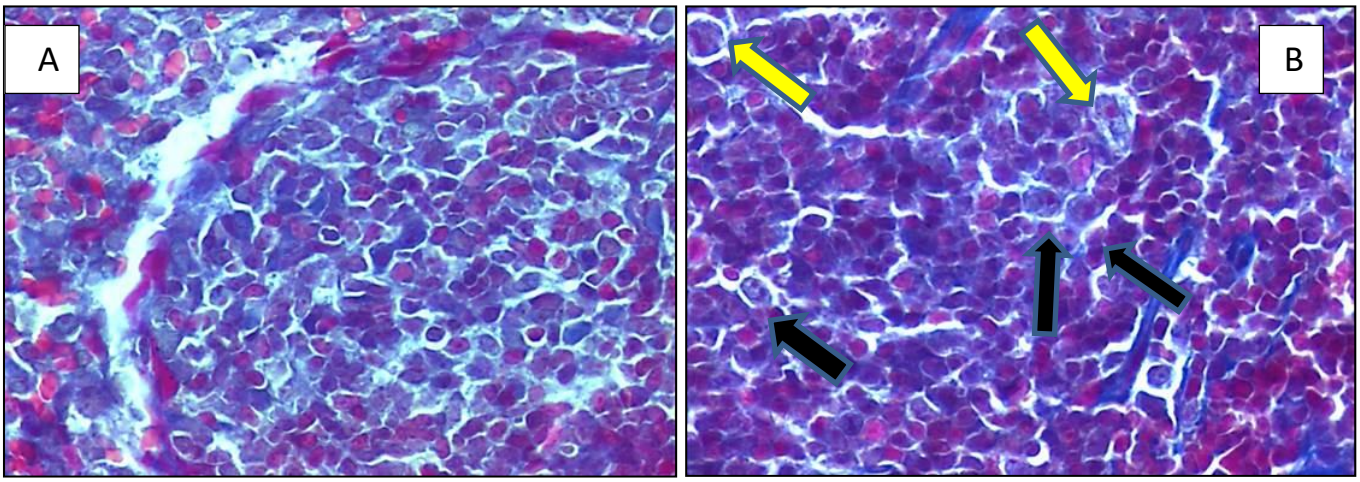


Figure (9): A/ Across section of the spleen tissue in the Control group **B/** Across section of the spleen tissue in the hyperprolactinemia group.note Many plasma cells (black arrow) and centroblasts (yellow arrow) were observed, indicating the secondary lymph follicle germinal center. **MTS. 400x.**

Discussion

The results revealed the histological structure of the spleen occurrence of histological changes in hyperprolactinemia group compared with the control, Note the white pulp area increased covered about 50% of the spleen area compared with the red pulp area and rats showed there is marked hyperplasia of the white pulp tissue. The secondary lymph follicle germinal center was observed, note the active germinal center, the marginal zone, and the mental zone.It was found by Taliaferro and Taliaferro (1995) (20) that normal spleen tissue may occasionally include plasma cells. These cells may grow in number when subjected to experimental settings and when an infection is present.. Despite the fact that Jeurissen (21) did not identify plasma cells as one of the primary cellular components of the red pulp, he did indicate that they were dispersed throughout the red pulp. According to Jeurissen (20), the findings of the current investigation are consistent with those that were recently reported.

Conclusion

The results of this study indicate that histological changes in the spleen occur as a result of hypreprolactinemia, as the study showed an increase in prolactin levels ,This led to changes in the histological composition of the spleen.

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