



Study of some immune modulatory indicators IgE, IgG in Patients infected with the Echinococcus granulosus Parasite in Babylon Province

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ABSTRACT

The modern study, which was conducted during the retro from (1/5/2022 to 31/12/2022), aimed at following up people with echinococcosis in the hospitals of Babylon Governorate and some of its different districts, which included Imam Al-Sadiq Hospital, Marjan Hospital, Hilla Surgical Hospital, and Imam Ali Hospital. In order to determine the prevalence of Echinococcus granulosus by measuring some immunological indicators to patients before and after the operation to remove the cysts and comparing them to the control group healthiests. The study included an examination of 94 blood samples distributed to three groups 3 blood samples for people effected echinococcosis before the process of removing the hydatidcysts (12 males and 20 females) and 32 blood samples for people after surgery And remove hydatidcysts and during (3-6) months (21 males, 11 females) and 30 samples of control group (healthiests.) (17 males and 13 female) and clinical examination were made by doctors consultants The results of the current study of immune indicators in the level of IGG, IGE in the patients are significantly high and according to cyst site where the liver record in the IGE reached 604 ± 81.2 either IgG * 1462 ± 20.2 and less level the shared injury of 381 ± 31.1 and 1388 ± 32.1 for IgE, IgG and respectively. As for the size of the cyst, the largest size of 5 cm has been the highest level of antibodies 431 ± 24 , 1464 ± 26.4 , and respectively and less in the size of the least of 5 cm 369 ± 30.3 , 1401 ± 20.7 IgG, IGE and respectively. Either for the level of IGE for the sex of the effected patients before and after the process is significantly increasing in males and females before the process is 435 ± 37.2 A, 387 ± 31.6 Either after the operation was 419 ± 37.3 , 317 ± 19.7 and respectively. While IGG level has increased infected with echinococcosis before the process in males and females a 1449 ± 43.1 and b 1417 ± 21.4 respectively compared to them after the process 832 ± 12.4 *, 820 ± 15.3 . The statistical study has recorded significant differences at the probability level of $P < 0.05$ and compared with the control group * 789 ± 17.2 and 752 ± 14.3 for males and females respectively

Keywords: *immunity, echinococcosis, females, IGG*

INTRODUCTION

Hydatid disease is a wide spread in all countries of the world, and for large numbers of dogs and adults worms (1). It is one of the chronic diseases in humans to continue having a cyst for long time (2) The disease is known as many labels, including Hydatidosis, echinococcosis or cystic echinococcosis (3-6) Carnivorous definitive host for the parasite and include the canine (Dogs, hyens, wolves, vanity and some For other fierce animals) while animals are Herbivorous such as (sheep, cows, camels, buffalo, horses and others) Intermediate Host for parasite (7-9) The disease affects parts that exist in human and the intermediate host, especially liver and lung, followed by the rest of the parts, such as spleen, brain and other muscles except for hair and nails (10-13) Immune system plays an important role and large in resistance to parasitic diseases caused by Hydatid Cysts (14-17) cellular and humoral immunity has great impact on reducing and not repeated and inhibits the effectiveness of Hydatid Cysts the inside the textile, which constitute a major risk in the possibility of the return of injury and increases the activity of parasites and vitality (18-22) The parasitic infection stimulates the IGE antagonism by linking Mast cells and producing amino-active blood vessels and increasing its expansion and cyst necrosis and parasite death (23-26) The concentration of IGG is increasing in the serums patients of Hydatid Cysts with high level (27-30)

MATERIALS AND METHODS OF WORK

Estimation of IgE globulin concentration by ELISA

Estimating the concentration of IgE by ELISA technique

Principle of the Assay

The working principle is based on the enzyme-linked immunosorbent adsorption test

working procedure

The test has been conducted at room temperature and the pregnant has been numbered and then taking 25 microlitre for both standard and control and placed in its microplate within their drill after

that Piwtain detector was added for all drilling by 100 microlitre after it was placed on the vortex for 30-second and then covered the plate and received a temperature (18-26m) and for 30 minutes after that drill was washed with a solution for three times (300 microliters) and then 100 microliter of TMB for all drilling and then at a room temperature and for 15 minutes and finally added (50 microliters) from the stop solution for each hole and then put the plate on the vortex to mix the solution and then read after 15 Minute in spectrophotometer and measure the absorption coefficient for each hole and a 450 nanometer wavy length. Where the concentration of immunoglobulin IgE is calculated in international unit / ml and according to the following rate sample concentration = optical density of the sample / optical density of the standard * concentration of the standard (Vercelli, 1995; Hide et al, 1993) We draw the standard curve of the IgE antibody and drop the absorbance value on the curve and calculate the corresponding concentration.

Statistical analysis

The results of the current study were subjected to statistical analysis in order to find out the significant differences. The Statistical package for Social Sciences (spss) version 23 was used, and according to the data of the current study, the Chi-Square test and the L.S.D test were used to study the prevalence of infection. cystic echinococcosis, and the T-test was used for the immunoserologic study to find out the significant differences in the study and at the level of probability $P < 0.05$ (12)

Estimation of IgG globulin concentration

Single Radial Immuno Diffusion Test

Principle of the Assay

The principle of the test depends on the spread of proteins in the agarose gel containing the specific antibody, which forms a visible ring as a result of the (immune complex) interaction between the protein (immune globulin) and the resulting specific antibody (13)

Working Procedure

the Agar Plates has used which manufactured from Liofilchem and that each plate consists of 12 holes to measure the Claubiolin IGG and each hole 5 micrometer. the plates has left after extracting from the refrigerator with room temperature and for 5 minutes to evaporates intensive water on them, as well as extracted frozen serum from frozen and left in the lab to dissolve and then be placed in every 5 micrometer hole from each sample and left For 15 minutes until serum is absorbed with a complete image and covers the plate and is placed in a wet place and for 48 hours. After 48 hours, the spread of radial beagons is observed circle and is offset by the anti-corridor in the agar plates and with a circular line with a given dimension and increases the focus of the antibody in the sample, and the amount of antibodies is measured by measuring the diameter of the ring in the Agar plates by in-kind lens included from (1-8) mm and then compared measurements with traces of pit in a table facility with multiple testing

Statistical analysis

The results the current study of statistical analysis has been subjected to know Moral differences where statistic package for Social Sciences (SPSS) used version 23 and according to the current study data, each test (CHI-Square Test) and test L.S.D in the studying of the the spread of echinococosis and the T-Test test was used for the study immune serum to be aware moral differences in the study and at the probability of $P < 0.05(12)$

RESULTS

The level of Igg and IgE antibodies according to the effect of the hydatid cyst location

The results shown in the table (1) showed the effect of the location of the hydatid cyst in the presence of significant differences and a probability level of $P < 0.05$ in the level of IgE and IgG antibodies, where patients with liver cysts recorded the highest level of 604 ± 81.2 international units per milliliter and (1462 ± 20.2) mg / . deciliter, while the lowest level for patients with joint injury in the liver and lung was (381 ± 31.3) international units / milliliter (1388 ± 32.1) mg/ deciliter

TABLE 1: of levels of IgG and IgE antibodies in patients with echinococcosis according to the location of the hydatid cyst

Antabodies		
IgG M±SE	IgE M ±SE	CystLocation
1462±20.2*	604±81.2 *	Liver
1395±103	389±30.5	Lung
1388±32.1	381±31.1	Liver+Lung
11.9	23.6	P<0.0 LSD

The level of IgG and IgE antibodies according to the effect of hydatid cyst size

The results in table (2) showed a significant increase in the level of IgE and IgG antibodies according to the size of the cyst, as those with

hydatid cysts larger than 5 cm reached 431 ± 24 IU / ml and 1464 ± 26.4 mg / dL, compared to those with cysts smaller than 5 cm, which reached 369 ± 30.3 IU/mL and 1401 ± 20.7 mg/dL, respectively

TABLE 2: The level of IgG and IgE antibodies in patients with echinococcosis according to the size of the hydatid cyst

Antibodies		Cyst size
IgG M±SE	IgE M±SE	
1401±20.7	369±30.3	Less than 5cm
1464±26.4	431±24	Greater than 5cm
5.3	7.2	T arithetic
2.01	2.01	Tabular T P<0.05

The level of IgG and IgE antibodies in patients with hydatid disease before and after surgery

The results of the current study indicated a statistically significant increase at the level of

probability $P < 0.05$ in the level of IgE and IgG antibodies for hydatid cysts patients and according to gender, before and after the surgical operation and compared with the control group .

TABLE 3: IgE antibody level (international units / milliliter) according to sex in the serum of patients with echinococcosis before and after the operation

LSD $P < 0.05$	After the operation	Before the operation	Control M± SE	sex
12.6	419± 37.3*	*a 435±37.2	345± 20.3*	Males
10.3	317± 19.7	B 387±31.6	302± 39.2	Females
	8.4	4.8	4.2	T arithetic
	2.01	2.01	2.01	Tabular T P<0.05

TABLE 4: IgE antibody level (international units / milliliter) according to sex in the serum of patients with echinococcosis before and after the operation

LSD P 0.05	After the operation	Before the operation	Control M± SE	sex
17.5	*832± 12.4	a* 1449±43.1	789±17.2*	Males
15.4	820± 15.3	B 1417±21.4	752±14.3	Females
	2.7	3.8	3.1	T arithmetic
	2.01	2.01	2.01	Tabular T P0.05

DISCUSSION

Berg Dar (2020) indicated that the injury of liver cyst had a significant impact on immunity and increased level IGG when compared with lung cysts or other parts and had agreed with the results of our current study IGG has risen in patients with liver cysts compared to injury in other parts of the body. Our current study has also agreed with Shammari (2019) in terms of high

level IgG in liver cysts injuries. The impact of the part of the injury in the cyst is considered to be significant enhancement levels. Many studies showed the location of the cyst plays a major role in the rise of the immune response, especially in an important organ such as the liver, compared to other affected organs in the body. The results of the current study differed with the results of the study(17)as it indicated that there was no

relationship between the level of antibodies and the location of hydatid cysts. . As for the high level of IgE antibody in patients with hydatid cysts in the liver compared to the rest of the organs showed the level of IgG and IgE antibodies according to the effect of the size of the hydatid cyst .

The amount of the level of IgG and IgE antibodies according to the effect of the size of the hydatid cyst.

The results of the current study showed a significant increase in the level of immune antibodies according to the size of the hydatid cyst, as shown in Table (2-4), where the larger the size of the cyst, the higher the levels of IgE and IgG antibodies compared to the sizes of small cysts. It is consistent with Birag Dar 2020 and Albu Saabar (2019) and the results of several studies that indicated the association of large cyst size with the increase in the level of IgG and IgE antibodies, and that the low level of IgG and IgE antibodies accompanies the small sizes of the hydatid cyst. While Al et Aydin (2018) noted that there is no relationship between the size of the cyst and the level of immune antibodies, but the relationship is in patients whose bodies have burst hydatid cysts, so the levels of antibodies are high compared to patients with burst cysts. The rise in IgG and IgE levels is directly proportional to the increase in the size of the hydatid cyst and the growth of the parasite. Sometimes the level of IgG antibody is high for several months, or it may be an immune complex and is eliminated by excretion outside the body by the lymphatic organs (18). Either In chronic infections, in which the cysts are large in size, there is an increase in the levels of immune antibodies, which activates immunity and the formation of T cells for cellular compounds that activate B cells and stimulate the highest level of IgE and IgE antibodies. The high level of IgE antibody has a major role in allergic reactions, one of the signs of patients Where it participates in the rise of eosinophils and the level of histamine and mast cells in the blood,(19). Also, the high increase in the level of immunoglobulin IgE is one of the most important characteristics of infection with parasitic worms (19,20). In the case of surgical

operations, removal of hydatid cysts, and patients recovering from infection, the levels of immunoglobulins IgG and IgE decrease, and this is consistent with the results of our current study. Table (3) and (4) and with what was indicated by (21) during his study of patients' cases after removing the hydatid cysts and measuring the level of globulins IgM, IgG, IgE, IgA, so there is no the IgE antibody level decreased gradually and within 6 months it reached the normal level after the operation and removal of the cyst. Likewise, our study agreed with Birag Dar (2020), and our study did not agree in terms of the continuous rise and more than a year of the level of immunoglobulin IgG after the surgical procedure.

Many parasitological studies have shown that Echinococcus granulomatosis stimulates Th2 lymphocytes and cells that contribute to the immune response and the secretion of compounds that stimulate the differentiation and growth of B cells to release the highest levels of IgE, IgG(22,23)

(24) indicated that patients with burst hydatid cysts have a significant increase in the level of globulins, IgG, IgE, and an increase in sensitivity. Also(25)that before the operation and for a period of more than two weeks, there is an increase in the level of IgG compared with healthy people. Anaphylactic(22) confirmed that the levels of IgE and IgG antibodies increased in those with hydatid cysts compared to healthy people. Specialized scientific studies have indicated a delayed decrease in the level of IgG immunoglobulin for long periods after surgery (26) . and(27) found that patients with chronic or late echinococcus aureus have an increased level of IgG antibody

Differentiation and growth of B cells to release the highest levels of IgE,IgG .., 2003 al et Goldsby . The large amount of IgG antibody in the blood and lymph gives importance in defense against pathogens outside the cells of the body, as well as helps in activating the hydatid Cysts system. Sometimes the increase in IgG and IgE antibodies is due to some antigens presented by the hydatid parasite, which activates the immune response to liberate IgE . IgG. The current study indicated a significant increase in the level of IgG

and IgE antibodies at a probability level of $P < 0.05$ in males compared to females for all study groups. This may be due to the physiological nature of males, which is characterized by increased immunological indicators when compared to females, and this is consistent with Berg Dar (2020) and Albusaber (2019), as well as other studies

CONCLUSION

The high level of IgE antibody has a major role in allergic reactions, one of the signs of patients Where it participates in the rise of eosinophils and the level of histamine and mast cells in the blood,(19). Also, the high increase in the level of immunoglobulin IgE is one of the most important characteristics of infection with parasitic worms (19,20). In the case of surgical operations, removal of hydatid cysts, and patients recovering from infection, the levels of immunoglobulins IgG and IgE decrease, and this is consistent with the results of our current study.

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