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ORIGINAL ARTICLE

Study the Levels of Total Enzymatic Antioxidants in Patients with Hydatid Cysts

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KEYWORDS

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ABSTRACT: The current study was done at the Department of Biology, Faculty of Education for Girls, University of Kufa, from May 2019 to April 2020, with the goal of detecting the levels of Total antioxidants in serum of patients before and after hydatid cyst excision. Farmers had the greatest percentages (71.42 %) in the current survey, followed by self-employed people in seven cases (16.67%). This conclusion was supported by additional research. study recorded that the infections was higher among illiterate than literate individuals, and reported that 26 cases (61.90%) were illiterate, 8 cases (19.04%) were primary school, 5 cases (11.90%) were secondary school and 4 cases (9.52%) were of high education which was statistically highly significant (P≤0.05). The results of the concentration of Total antioxidants in serum of patients before hydatid cyst removal using the ELISA technique revealed a significant increase (P 0.05) in the level of Total antioxidants before removing the hydatid cysts, which was 1397.328.35, compared to the level of Total antioxidants after removing the hydatid cysts, which was 1213.413.96, and healthy 1767.913.95. The total antioxidant levels increased significantly (P 0.05) as a function of the ELISA test.

INTRODUCTION

Echinococcosis is a disease that affects people all over the world. It's also known as echinococcal illness or hydatid disease. Cystic echinococcosis is a disease transferred from canidae to slaughter animals and, by chance, to humans. As a result, it's a zoonotic illness. [1]. *E. Granulosus* eggs are discharged in the feces of hosts who have the parasite's adult phase in their intestines, and these eggs infect a variety of animals, including sheep, goats, cattle, and humans, who serve as natural intermediate hosts. The condition is mostly liver-related, although it can also affect the kidneys, spleen, brain, bones, and heart. [2]. *E. granulosus* has two types of hosts in its life cycle: ultimate hosts, which are dogs and other Canidae members, and intermediate hosts, which are other Canidae members. The parasite multiplies in the organs and tissues of animals such as sheep, pigs, and camels in the second host, referred to as the intermediate host. An unintentional intermediate host is the human. [3]. Within cells, free radicals interact with other molecules. Membranes and DNA may be damaged by oxidative stress. Antioxidant enzymes like superoxide dismutase (SOD) and glutathione peroxidase (GPx) are produced by the body to protect it self from oxidative damage [4-6]. The etiology of certain parasitic diseases has been linked to oxidative stress and alterations in antioxidant status [6, 7].

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MATERIALS AND METHODS

The study included 42 sick people who were diagnosed with cystic echinococcosis through clinical assessment, radiography, and magnetic resonance imaging, as well as 30 healthy men who were not infected with cystic echinococcosis or any other medical condition as determined by clinical, radiological, and magnetic resonance examination, and who visited the Surgical Subspecialties Consultant at Al-Sadr Medical City and Al-Hakeem General Hospital between October 2019 and December 2020. Patients were followed on before and after surgical excision of hydatid cysts for a period of 5-8 months to conduct blood and immunological tests and establish the pathological status of the cysts. The patient's name, sex, residence, age, additional ailments, and the date of the procedure were all included in a questionnaire. A 3 mL blood sample was withdrawn from the patient and healthy groups under study with a 5 ml syringe. The blood was put in non-anticoagulant test tubes and centrifuged at 3000 cycles per minute for 20 minutes to obtain serum for the purpose of assessing total antioxidant levels, and the serum was kept at a temperature of (-20) until it was utilized in experiments. Using the ELISA approach, the amounts of total antioxidants in the serum of people with hydatidosis and healthy people were determined [8, 9]**.**

Statistical analysis

Statistical Package for Social Sciences [SPSS] version 16 was used to analyze the data by calculating the mean and standard error and using the T-test. The P-Value was calculated to find the significant differences between the treatments [10].

RESULTS AND DISCUSSION

Farmers had the greatest percentages (71.42%) in the current survey, followed by self-employed people in seven cases (16.67%). This finding was supported by additional research. [11] found that 58 cases (70.7%) were identified as housewives. [12] According to the study, the percentage of hydatid illness was greater among housewives 53 (34.64 percent), which might be related to their intimate contact with infection sources, such as dirt or vegetables infected with eggs from dog poop. Regarding the occupation, it was found that the highest infection rate was reported among Farmers in 30 cases (71.42%) followed by self-employed in 7 cases (16.67%) the lowest rate of infection was recorded among the students in 2 case (4.76%). The difference between occupation and seropositivity was statistically highly significant (P-Value ≤ 0.05), as shown in Table 1.

Table 1. Distribution of infections of hydatid cysts using ELISA according tooccupation.

Occupation	NO	%
Farmers	30	71.42
self employed	7	16.67
Self employed	3	7.14
Students	2	4.76
Total	42	100

The current study found that illiterate people were more likely to get infections than literate people, with 26 cases (61.90 %) being illiterate, 8 cases (19.04 %) being primary school, 5 cases (11.90 %) being secondary school, and 4 cases (9.52 %) being high school, all of which were statistically significant (P0.05). According to [13], the frequency of CE had a substantial link with education, with 9 (60%) of 15 afflicted people in Sulaimania being illiterate [14]. In a descriptive study in Saudi on 67 patients, 43 (64.2%) were illiterate, 13 (19.4%) could read and write, and only 11(16.4%) had education beyond primary school. In Iran, [15] According to the study, uneducated persons had the greatest sero prevalence of hydatid illness at 2.1 percent. These data back up the link between personal knowledge, cleanliness, and the likelihood of contracting an illness. Hydatid illness may be avoided, and one of the most efficient ways to do so is via knowledge. It's critical that health officials take a proactive approach to raising

community awareness and implementing control techniques through education.

In terms of educational status, the results showed that illiterate persons had greater levels than educated ones, with 26 instances (61.90 percent) being illiterate. As demonstrated in Table 1, the disparities in educational levels were statistically very highly significant (P-Value 0.05). (Table 2).

Table 2. Distribution of seropositivity of hydatid cysts using ELISA according to education

Level of Education	NO	%
Illiterate	26	61.90
Primary school	8	19.04
secondary school	5	11.90
High education	4	9.52
Total	42	100

Antioxidant systems are found in cells and serve a critical function in defending against reactive oxygen species by removing or avoiding oxidative damage [16]. Antioxidant enzymes such as superoxide dismutase (SOD), catalase, glutathione peroxidase (GPx), and glucose 6-phosphate dehydrogenase (G6PD), as well as metal linkage proteins (nonenzymatic substances like ceruloplasmin, and albumin), vitamins (alpha-tocopherol, beta-carotene), and trace elements iron, copper, and zinc) make up the antioxidant status [17].

The results showed in Tables 3 and 4 a significant decrease in the level of Total antioxidant in the group of patients with cystic dermatitis before cyst removal, as it reached 1397.3±28.35, (enzymatic unit / micromole) compared to the level of Total antioxidants after the removing of the hydatid cysts, which was 1213.4±13.96, and healthy 1767.9±13.95.

Table 3. level of Total antioxidants before and after removal of Hydatid cysts

Parameters	Patients before the removal of Hydatid cysts [M ± SE] n=42	Patients after the removal of Hydatid cysts [M ± SE] n=42	P-value
Total	1397.3±28.35	1213.4±13.96	0.000023

Table 4. level of Total antioxidants in Healthy and Patient of Hydatid cysts

Parameters	Healthy [M ± SE] n=30	Patient [M ± SE] n=42	P-value
Total	1767.9±13.95	1213.4±13.96	0.00042

And statistical analysis showed that there were significant differences at the probability level of 0 $P \leq 0.05$. The decline in Total antioxidants in sick people with epithelial cystic disease before cyst removal may be due to the involvement of these enzymes as anti-inflammatory as well as their duty to protect cells from free radicals, particularly lipid oxidation, and that rising oxidative stress in sick people with epithelial cysts leads to a decrease in the efficiency of paraoxonase and aryl esterase enzymes, as well as induction of oxidative stress [18]. In parasitic infections, the host reacts to parasites with free radicals which cause oxidative stress. In reaction to the cyst virulence, the hydatid cyst activates phagocytic cells in the host's immunosuppression system, leading in the generation of reactive oxygen and nitrogen products by host macrophages and leukocytes [19]. The reason for increased lipid peroxidation in patients with cystic echinococcosis may be related to decreased antioxidant enzymes [2]. Reported a rise in levels of Total antioxidants in serum of healthy compared to the level of Total antioxidants in patients [18]. the levels of (GPx) and (PON1) test for the serum of patients infected with hydatidosis a significant decrease ($P \leq 0.05$) in the amount of the levels of antioxidants before removing the hydatid cysts, which amounted 57.39±1.25 and 17.8± 6.70 respectively, compared to the quantification of the levels

of antioxidants after the removing of the hydatid cysts, which was 73.94±1.65 and 57.69±6.30 respectively, and healthy which amounted .12±5.94 1 19 and 226.5 ± 13.21 respectively. In organisms, there are enzymatic and non - enzymatic antioxidants that work to stop free radical damage [20]. In a healthy person, the amounts of oxidants and antioxidants are balanced. Oxidative stress is caused by an increase in oxidant synthesis, a decrease in antioxidant levels, or a mixture of both. The role of oxidative stress and antioxidants in the development of numerous parasite illnesses and inflammation events has been proven in several researches [7].

CONCLUSIONS

The highest infection rate was reported among Farmers, the highest rate of cysts granulosus from dog feces, the lowest rate of infection was recorded among the students.

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Conflict of interest

The Authors declares no conflict of interest.

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