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Analysis of Chemical Component of Hydatid fluid in infected sheep with Echinecoccus granulosus

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***Abstract**: The aim of this study we attempt to identify and measured many chemical components of the cyst fluid and compare them with the serum level of infected animals. We collect 25 samples of lung hydatid cyst and blood of infected sheep from Baghdad / Al-Shalla . The existing Ca, P, Mg, Na and K were measured by a auto analyzer apparatus. The result of T.test showed there are a significant difference between serum and fluid of cyst in all electrolytes (P<0.001). Electrolytes show a significant difference between infected sheep and normal sheep. The entrance of essential electrolytes have depended on selective permeability and parasite requirement which comfier in our results. P and Ca have vital roles in the prevention acidity of hydatid cyst fluid. By understanding parasite nutrition behavior would help us to develop new drugs to treat and prevent hydatidosis by inhibit nutrition metabolism with another physiological reaction in the pathogen.*
***Keywords:-** Hydatid fluid, Echinococcus granulosus, Biochemical compound*

I. Introduction

Hydatidos is caused by larval stage of Echinococcus graunlosus in human and domestic animals. Adult worm lives in small intestine of dogs and Canidae as definitive hosts. The length of worm is 4-7mm and the maturation period is 55-60 days. Worm excretes one proglotid, which containe $1 - 1\times10^{2}$ d 2×0^{3} P eggs every two weeks. The environment is contaminated with more than billions eggs daily. (1)

The Echinococcus graunlosus infections have been further classified as domestic and sylvatic; in the domestic form sheep serves as the most common intermediate host while in the sylvatic form the usual intermediate hosts are caribou or moose. (2)

The hydatid cyst incidence in sheep , goat , cattle and camel and the organ involvement are reported that the sheep is highly sensitive to the E.granulosus sheep G strain and in this intermediate host the hydatid cysts are mostly fertile. (3)

E.granulosus is the most prevalent species in all contents causing considerable public health problems in many regions of the world. (4) Furthermore, it is also common in Iraq. (5)

The Epidemiological situation of parasite is complicated by the fact that several have been identifie d in most area where infection is endemic , these strains exhibit different degrees of infectivity for certain intermediate hosts , previously , strains were identified using morphological , biological , biochemical and some other criteria . However , in recent years molecular technique have contributed in more precise strain identification at the DNA level. (6)

Biochemical studies are useful in differentiating strain variations of E.granulosus in different countries. [(7)] .There are essential and vital elements in the cyst fluid that are very important in the biology of parasite. The composition of cyst content may differ in various area and strains. The composition of hydatid cyst fluid is nearly 90% , the same as host serum. The various Electrolyte , Enzymes , Proteins , Lipids , Vitamins and Hydrocarbons were seen in hydatid cyst fluid. (8)

The relationship between parasite and host is very important to understanding how parasites can grow in the body and what are the requirements of parasites , are useful in understanding the ways for prevention of the parasite.

There is no more information on cyst composition and existing data belong to previous studies of many years ago. (9, 10)

In this study we attempt to identify some electrolytes of cyst fluid and compare them with the

serum level of infected animals.

II. Research Methods

Fifty five lung hydatid cyst were collected from infected sheep in Baghdad / Al – Swatha . for comparison of content of hydatid cyst and serum.

Blood sample were also collected. Samples were carefully transport on ice to parasitology laboratory of veterinary college of Baghdad. The cyst fluid was aspirated by sterile needle in aseptic condition and was centrifuged at 10^3 rpm for five minutes then super ant fluid was stored in -20^{o}C until use.

The blood samples were centrifuged for getting serum and they were stored in -20^{o}C. After collection all of samples, level of Ca , Mg , Na , K and P in hydatid cyst fluid and serum of infected sheep were measured by the auto analyzer apparatus. Na and K were measured by flame photometry technique. Measurement method for detection of Ca , P and Mg was performed by cresol Phetoloin , Molibdate reductase and Zylidile blue respectively. (8) The T. test was used for statically method .

III. Results

The levels of the electrolytes in hydatid cyst fluid ant serum sample are shown in table 1 and 2.

"Table "(1): Electrolytes amount in hydatid cyst fluid in sheep infected with hydatidosis.

	No	Min	Max	Mean	Std.
Ca	25	8.85	9.85	19.13	0.18
P	25	0.5	0.89	0.67	0.47
Mg	25	1.90	2.49	2.26	0.14
K	25	4.0	4.8	4.626	0.01
Na	25	110.00	128.9	20.988	4.012

"Table" (2): Electrolytes amount in serum from sheep infected with hydatidosis.

	No	Min	Max	Mean	Std.
Ca	25	8.99	10.7	9.72	0.026
P	25	3.25	5.2	4.44	0.081
Mg	25	2.10	3.10	2.796	0.216
Na	25	118	134	130.16	4.294
K	25	3.7	4.89	4.34	0.249

In this study we found a significant difference between rang in electrolytes in infected sheep and normal rang in healthy individuals (P<0.001) (Table 3) .

"Table" (3): Electrolytes amount in serum of infected sheep and normal sheep P<0.001.

	Ca	P	Mg	Na	K
Normal rang	11.5-12.8	5-7.3	2.2-2.8	141-161	4-9.5
Test group	9.72	4.4	2.796	130.16	4.34

Na & K were measured by Meq/L and Ca , Mg and P by Milligram/dh

Table (4) indicates that there are significant difference between hydatid cyst fluid and serum in level of all studied electrolytes (P<0.001). The means number of electrolytes in serum are higher than hydatid cyst fluid expect K.

"Table" (4): Comparison of electrolytes in hydatid cyst fluid and serum of infected sheep with lung hydatidosis (P<0.001).

		Mean	Std.	P.Value
Pair 1	Ca(H) Ca(S)	-0.59	-0.154	P<0.001
Pair 2	P(H) P(S)	-3.77	0.389	P<0.001
Pair 3	Mg(H) Mg(S)	-0.536	-0.121	P<0.001
Pair 4	Na(H) Na(S)	-9.172	-0.282	P<0.001
Pair 5	K(H) K(S)	0.286	-0.239	P<0.001

III. Discussion

There is a little knowledge about composition of hydatid cyst fluid , (8) indicated that the amount of Ca and Mg in protoscolex of hydatid cyst were more than in cyst fluid while Cl and Na were the most ions in hydatid cyst fluid. The important role of Ca and P are for preventing the acidity of hydatid cyst fluid and they are found as calcareous body in the cyst. (8)
The analysis of liquid aspiration of suspended cyst and identification of electrolytes can be useful for hydatid cyst diagnosis from other non parasitic cyst in human. (11)
This study show that means level of Ca, P, Na and K of infected sheep serum is less than the normal rang. It may be because parasite uses electrolyte for production of calcareous body in cyst. There is a

significan betwee
t difference between two other groups' else Mg. There are significant differences n
cyst fluid and serum of infected sheep in all of electrolytes level (P<0.001). Amounts of electrolytes in serum were higher than cyst fluid. Vidor et al; explained that Na , Cl and bicarbonate in hydatid cyst fluid were the same as serum but Ca and K were more in hydatid cyst fluid and phosphate were reverse. (12, 13)

possibl
The differences in biochemical composition of different hydatid cyst fluids suggest the e existence of more than one strain of E.granulosus in human and other intermediate domestic animal hosts in endemic areas. (14)
This is most probably due to complex geographical strain and sub strain variance plus fundamental biochemical and physiological differences, which may occur among various animal species in different of the world. (15). However, there is a certain close affinity and similarity between sheep and human forms of Echinococcus granulosus in infectivity and biochemical metabolism. (15, 16)

IV. Conclusion

This study clearly indicate that Biochemical , Physiological metabolic differences , protoscolices content , geographical strain or sub strain or substrain may all affect the chemical composition of hydatid cyst fluid which might in turn aid in the identification of the source of human infection.

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