

Comparative Biochemical Study of Hydatid Cyst Fluid of Echinococcus granulosus Isolated from Infected Human, Sheep and Cattle in Baghdad City

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Abstract: Echinococcosis is recognized as being one of the world's major zoonosis. hydatid disease is endemic in Iraq where many domestic animals including sheep, cattle, goat and camel act as intermediate hosts. The distribution of hydatidosis is normally associated with underdeveloped countries, especially in rural communities. Biochemical study in hydatid cyst fluid of sheep, human and cattle has been made in Baghdad city .with respect to biochemical profile of hydatid cyst fluid of Echinococcus granulosus, the following substances in cystic fluid of hydatid cyst isolated from infected sheep, human and cattle, were measured namely: calcium, glucose, cholesterol and triglycerides. There are no significant differences statistically. But the levels of all these substances were slightly in quantitative variations.

Keywords: Hydatid fluid, Echinococcus granulosus, Animal, Human

I. Introduction

Echinococcus granulosus cause an important zoonosis disease called hydatidosis. There is a worldwide distribution in both epidemiological ways (sylvatic and pastoral), (1,2,3).

The indirect life cycle of the parasite utilizing dogs and other candies as definitive hosts and species of omnivorous and herbivorous including wildlife and domesticated livestock as intermediate host .when the definitive host eats an infected intermediate host organ,the life cycle is complete, the human exposure was by faecal –oral way, with food or water contaminated by faeces of infected definitive host, (4).

Echinococcus granulosus is the most prevalent species in all continent which cause a considerer public health problems in many regions of the world, (5).

the epidemiological situation of this parasite is complicated by the fact of some identified strains in most area where infection is endemic, which exhibit different degrees of infectivity to certain intermediate hosts

strains identification by using biological, biochemical, morphological and other criteria, such as molecular techniques in recent years, which contributed in more precise strain identification at the DNA level, (6).

The biochemical studies are useful in differentiating strain variation and determination of Echinococcus granulosus in different regions, (7). The characterizations of strains are important in the regions where there is the possibility of different cycle transmission and sources of infection for human, (7).

The wide variety of animal species, both domestic and wild, which act as intermediate host, have contributed to distribution of Echinococcus granulosus across the globe at least (10). genetically different distinct populations exist with Echinococcus granulosus complex (3,8).

The aim of the present study which is designed to evaluate the biochemical substance of hydatid cyst fluid from different host (sheep, cattle and human) to identify the strain variation of Echinococcus granulosus.

II. Materials And Methods

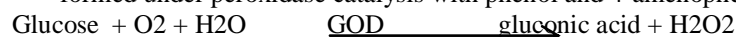
In this biochemical study, the hydatid cyst samples were collected, Al-Shualla massacre and teaching Baghdad hospital, randomly from infected organs of sheep, cattle and human.

The samples were kept in cool box with ice. The hydatid cyst fluid was collected in disposable plastic tube.

For biochemical studies, fluids are taken to special test tube (5.8 ml), separated by centrifugation at 4000 rpm using centrifuge for 30 minute and stored in deep freezer (lab tech – Italy) at -40 °C until used, (8).

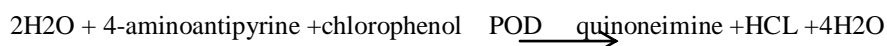
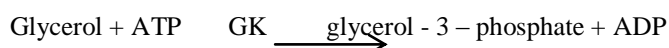
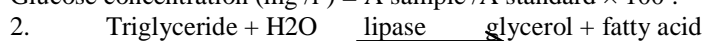
Biochemical analysis, glucose, triglycerides calcium and cholesterol were estimated by a diagnostic kit and auto-analyzer spectrophotometer.

1. Glucose determined after enzymatic oxidation in the presence of glucose oxidase. hydrogen peroxide formed under peroxidase catalysis with phenol and 4-aminophenozone to form a red-violet quinoneimine





Glucose concentration (mg /l) = A sample /A standard × 100 .

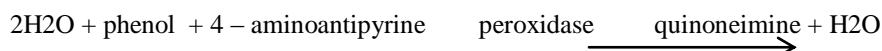
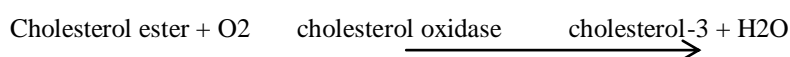
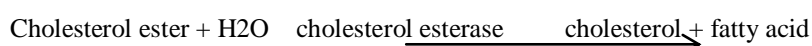


Triglyceride concentration = A sample /A standard × 200 (mg/dl)

3. Calcium ions formed a violet complex with O-cresolphthalein complex

Calcium concentration = A sample /A standard × 10(mg/dl)

4. Phenol and peroxidase



Concentration of cholesterol in sample = AA sample /AA standard × conc. Of standard (mg/ml)

III. Results

The biochemical profile of the hydatid cyst fluid of *Echinococcus granulosus* from all intermediate host (sheep , cattle and human) are shown in table (1) :

"Table"(1) Biochemical profile of hydatid cyst fluid from intermediate host (human, sheep, and cattle)

Biochemical profile /parameters	Human M ± SE	Sheep M ± SE	Cattle M ± SE
Cholesterol (mmol/L)	0.144 ± 0.01 (N = 50)	0.342 ± 0.13 (N = 50)	0.363 ± 0.14 (N = 50)
Triglycerides (mmol/L)	0.051 ± 0.003 (N = 50)	0.035 ± 0.007 (N = 50)	0.067 ± 0.01 (N = 50)
Glucose (mmol/L)	1.5 ± 0.23 (N = 50)	3.36 ± 0.69 (N = 50)	4.01 ± 0.8 (N = 50)
Calcium (mmol/L)	3.55 ± 0.45 (N = 50)	3.35 ± 0.66 (N = 50)	4.33 ± 0.68 (N = 50)

IV. Discussion

Hydatid cyst fluid of *Echinococcus granulosus* is chemical substance have an important role in metabolism and immunological function in parasite, (4).

There are different composition of biochemical substances in different strain of *Echinococcus granulosus* which also have variation in their metabolic function, (7) ,(6) .

We compared some biochemical substances of hydatid cyst fluid of *Echinococcus granulosus* in human , sheep and cattle , this biochemical comparison may can help in the characterization and identification of strain of *Echinococcus granulosus* in Baghdad city .

The hydatid cyst fluid of *Echinococcus granulosus* shown biochemical content in table (1) from the result, the level of calcium in hydatid cyst fluid of sheep was lowest, (8) ,(9) were shown the same result .

The concentration of glucose and cholesterol was shown the highest level in hydatid cyst fluid isolated from cattle , and lowest level in human hydatid cyst fluid .

The glucose content of sheep was shown higher in human. in this study the level of triglycerides content of hydatid cyst fluid of cattle was higher than other intermediate host cyst fluid , and triglycerides content of hydatid cyst fluid of sheep was the lowest as compared with other intermediate host .

There is certain close affinity and similarity between sheep and human forms of *Echinococcus granulosus* in infectivity and biochemical metabolism, (10) ,(11) .

In this study and others indicate clearly that physiological and biochemical ,metabolic difference , protoscolices contents ,geographical strain may all affect the chemical composition of hydatid cyst fluid which in true aid in the identification of the source of human infection ,(8),(9) because biochemical substance within hydatid cyst fluid play a definitive role in the metabolism , immunology and physiology of cystic hydatidosis , (12 , 13 , 14) .

Al-Obeidy (2005) during his study recorded some chemical composition such as glucose in hydatid cyst fluid in Mosul city ,(2) .Meerkhan (2001) ,found the some result of biochemical substance of hydatid cyst fluid of human and some intermediate host ,(10) .

V. Conclusion

There are no significant differences between biochemical substance of hydatid cyst fluids of intermediate host (human, sheep and cattle) in statistical analysis of this study results.

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