Cystic Echinococcosis in Jordan:
Seroepidemiology and IgG Subclass
Analysis of Selected Communities and Surgically Confirmed Patients

By

Arwa Mahmoud Qaqish
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Approved by:

Sami K. Abdel-Hafez........................................Chairman
Professor of Biological Sciences, Yarmouk University

Khaled M. Al-Qaoud........................................Member
Assistant Professor of Biological Sciences, Yarmouk University

Naim S. Ismail..............................................Member
Professor of Biological Sciences, The Hashemite University

Nizar M. Abu-Harfeel......................................Member
Professor of Biological Sciences, Jordan University of Science and Technology

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Abstract

A seroepidemiologic study of cystic echinococcosis (CE) in rural, semibedouin and bedouin human communities from northern Jordan was carried out using the enzyme linked immunosorbent assay (ELISA) and crude sheep hydatid fluid (CSHF) as a source of diagnostic antigens (Ags). A seroprevalence of 11.3%, 5.0% and 3.7% was found in 684 subjects from the rural population of Kofr-Abeel, 1077 subjects from the semibedouin population of Bowaida and Akaider and 241 subjects from the bedouin population of Safawi, respectively. This difference in seroprevalence was attributed to differences in environmental conditions where inhabitants of the Mediterranean environment of Kofr-Abeel seems to be under the probability of higher risk of infection with the infective stage of the parasite those living in the Irano-Turanian environment of Bowaida, Akaider and Safawi.

Analysis of knowledge, attitudes and practices (KAP) of the inhabitants of Kofr-Abeel, Bowaida and Akaider and Safawi as pertaining to CE revealed their poor knowledge of the source and cause of the disease in conjunction with practices and attitudes that sustain continuous transmission of the parasite in these communities.

Using CSHF-ELISA, IgG seropositive subjects from Kofr-Abeel, Bowaida, Akaider and Safawi were further subjected for IgG subclass analysis. The Seropositivity rates for IgG1 and IgG4 antibodies (Abs) were
47.9% and 2.1%, respectively. Although some of the decreased seropositivity may indicate the presence of false total IgG seropositivity, these results are interpreted as a reflection of asymptomatic versus symptomatic CE infection.

The CSHF-ELISA was further used for the detection of IgG and its different subclasses in the sera of a battery of 93 surgically confirmed CE patients. These sera showed significantly higher seropositivity for both total IgG (83.9%) and IgG1 (83.9%) Abs compared to IgG2 (20.5%), IgG3 (14.4%) and IgG4 (38.8%) Abs indicating their better suitability for clinical assessment purposes of serodiagnosis.

Using the CSHF-immunoblot (IB) technique, among 85 of the surgically confirmed sera, IgG1 and IgG4 Abs showed higher immunoreactivity at 72.9% and 51.8% for the 8-12, 16 and 20-24 kDa fractions of the highly specific to CE antigen B (AgB) compared to 51.8% and 28.2% for the 27.5 and 38.0 kDa fractions of the nonspecific antigen 5 (Ag5), respectively. This indicates similar specificity of both isotypes for the detection of CE infection.

The CSHF-ELISA was also used for the serologic follow up of changes in the total IgG, IgG1 and IgG4 Ab levels among 38 of the surgically confirmed patients before and at various periods up to 1.5 years after surgery (AS). Most of the cases remained seropositive for IgG and its
subclasses up to 1.5 years AS and the highest percentage of patients showed no significant changes in their Ab titers over the different periods before and after surgery. This may indicate the probability of non-successful complete surgeries and/or recurrence of the disease.