Simultaneous screening of serum anti-Echinococcus granulosus and E. multilocularis antibodies by ELISA

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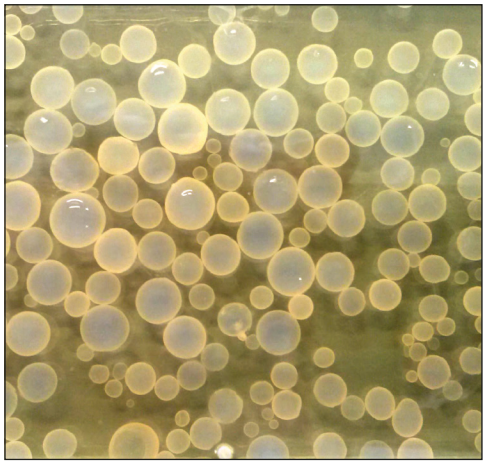

Axenic cultivation of E. multilocularis metacestode vesicles (courtesy of Prof. Brehm, Wuerzburg, Germany)

Panel	Anti-Echinococcus ELISA (IgG) Positive	Negative
Echinococcus multilocularis samples (n=52)	50*	2
Echinococcus granulosus samples (n=55)	54	1
Blood donors (n=50)	4	46
Tumor patients (n=50)	3	47
Sensitivity	97%	
Specificity	93%	

Determination of sensitivity and specificity using sera from patients with Echinococcus ssp. infections and clinically relevant controls (*contains two sera from patients with calcified lesions)

Infection with	n	Pos.
Fasciola hepatica	16	38%
Strongyloides stercoralis	10	0%
Taenia solium	7	14%
Trichinella spiralis	13	31%
Schistosoma ssp.	9	11%
Ascaris lumbricoides	11	73%
Plasmodium ssp.	7	14%
Toxocara spp.	10	0%
Anisakis	16	25%
Helminths, unspecified	2	0%
Entamoeba histolytica	11	0%
Leishmania ssp.	5	0%
Filaria	5	60%
Total	**122**	**22%**

Detailed specificity panel of sera from patients with confirmed parasitic diseases

Introduction

Infections with the tapeworms Echinococcus granulosus and Echinococcus multilocularis may cause **cystic (CE)** and **alveolar echinococcosis (AE)**, respectively. However, most target antigens used for commercial, serology-based assays display insufficient reactivity. Here, we determined the sensitivity and specificity of a novel ELISA based on an axenically produced antigen for the detection of antibodies against both E. granulosus and E. multilocularis.

Methods

We used **Echinococcus multilocularis metacestode vesicle fluid (EmVF)** as source for solid phase antigen to establish an anti-Echinococcus IgG ELISA and investigated a panel of 329 sera for the presence of species-specific anti-Echinococcus IgG, including 55 CE patients and 52 AE patients, 50 healthy blood donors, 50 non infectiological tumor patients, as well as 122 sera from patients with other parasitic infections.

Results

Investigation of pre-characterized sera from patients with clinically confirmed Echinococcus infections as well as controls revealed a sensitivity of 97% at a specificity of 93% in the Anti-Echinococcus ELISA (IgG). An overall cross reactivity of 22% was observed with other parasitic infections. In infections with Taenia solium and Schistosoma ssp. there was only one reactive serum each. Entamoeba histolytica, Leishmania ssp., Strongyloides stercoralis, Toxocara spp. and not further specified helminths infections showed no cross reactivity at all.

Conclusion

The Anti-Echinococcus ELISA (IgG) enables screening for Echinococcus ssp. infections with excellent sensitivity and good specificity. Axenically produced EmVF further exhibited low cross reactivity to antigens of other clinically relevant parasites.

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