Isoenzymes in Parasitic Disease

Pages with reference to book, From 1 To 2

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Isoenzymes are different molecular fonns of enzymes with similar enzymatic activity[1]. Isoenzyme pattern is an arrangement of one or more bands of enzymes. Isoenzyme profile is a series of isoenzymc pattern displayed by a strain or isolate, Zymodeme is an isoenzyme profile shared by one or more strain or isolates. lsoenzymes binding pattern can be used to classify parasite by difference inzymodeme. Different proteins consisting of a set ofisoenzymes have similar but not necessarily identical properties. Hetrogenicity among strains may be due to difference in zyinodeme pattern which distinguishes pathogenesis, virulence or susceptibility to drugs[2]. Isoenzyme play an important role inparasitic disease[3]. Variable pathogenicity and virulence has been associated with strains of E. histolytica[4,5]. Isolates of E. histolytica were clearly differentiated by isoenzyme electrophoresis from patients with clinical amoebiasis and asymptomatic subjects[6] and invasive and non-invasive E. histolytica[7]. Isoenzymes are frequently used to differentiate morphologically similar strains of other human parasitic protozoa[8]. Other amoeba that inhibit the intestine of man were examined by isoenzyme electrophoresis as morphological identification is difficult. Jsoenzyme pattern of non-pathogenic protozoa Entamoeba coli appear to be entirely different from E. histolytica[9]. Other non pathogenic protozoa F. hartmani, F. nana, I. butschlii and D. fragilis were compared with E. histolytica by electrophoresis pattern and found to be different[10]. Isoenzyme electrophoresis has been used to determine genetic interpretation of Trypanosomes[11]. Isoenzymes are also used to classify Trypanosoma[12] and to distinguish different forms of Trypanosoma cmzi involved in sylvatic and domestic cycles[13,14]. Isoenzymes variation also occurs in Leishmaniasis[15,16] Schistosomiasis[17] and plasmodial infection[18]. G. lamblia has been characterized by their isoenzymes pattern. Variation in isoenzyme pattern of G. lamblia correlated with difference in degree of infectivity, clinical pattern and host response to various drugs[19]. Difference in isoenzyme may distinguish between invasive and non-invasive strains and detection of 0. lamblia strains in symptomatic subjects[20]. Zymodeme difference occurs between isolates from symptomatic and asymptomatic subjects[21]. Hetrogenicity of 0. lamblia strains from widely separated areas and within a single region also occurs[22]. Isolates from single geographical location were genetically homogenous and consistent[23]. Giardia isolates from animals and humans were homogenous in protein binding pattern and any difference observed showed difference in antigenic reactivity[24]. Giardia of the same morphologic type and isoenzyme pattern may infect different animal species. Some strains from animal were more virulent[25]. Giardia antigen showed some minor differences not correlated with geographic location, virulence[26], or type of host[27]. As morphology alone does not always distinguish 0. lamblia from different hosts or different geographic locations, Giarclia isolates may be differentiated by their isoen.zyme profile[28]. Most commonly isolated isoenzymes are Phosphoglucomutase (PGM), Malic enzyme (ME), Glucose phosphate dehydrogenase (GPI), Hexokinase (HK), Lactate dehydrogenase (LDH) Malic dehydrogenase (MDH), Isocitrate Dehydrogenase (lCD) and Alkaline Phosphatase (AP) enzyme which are used for differentiation of Giardia isolates. As different isoenzymes are presentinG. lamblia, we attempted to see whether Lactate dehydrogenase (LDH) has any relationship with G. lamblia infection. A study was done at PMIRC Research Centre in collaboration with Aga Khan University to determine the relationship of LDH in giardiasis. We collected 12 specimens of duodenal fluid from patients diagnosed positive for 0. lamblia by direct microscopy of stool and G. lamblia antigen detection by ELISA and Immunofluorescence test. A group

of 24 apparently healthy adults were also tested. Specific activity of LDH in duodenal fluid was determined by spectrophotometer. LDH isoenzyme was determined by Polyacrylaniide gel electrophoresis (PAGE). Only one patient having active trophozoites in duodenal fluid was positive for LDH. It is possible that LDH might be due to some other disease or secretion of some intestinal metabolite might be providing an environment suitable for trophozoites to flourish in the duodenum. In G. lamblia infection the cellular enzyme LDH remains unaffected[29]. Giardia strains isolated from faecal samples of rodents were studied by thin layer starch gel electrophoresis at the London School of Hygiene and Tropical Medicine United Kingdom. Isoenzyme detected in Giardia strains from rodents were PGM (Phosphoglucomutase), Nucleoside hydrolase (NH), Alaninc aminotransferase (ALAT), while 6PGD (Phosphoglucose dehydrogenase) was not detected. It is possible that other isoenzymes mightbe present which need to be investigated. What is needed is to determine whether pathogenic or non-pathogenic strains exist in patients with G. lamblia infection or asymptomatic carriers and the role of isoenzymes in G. lamblia resistant strains not responding to drug therapy.

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