

**THE OCCURRENCE OF ADENOVIRUS PRECIPITATING ANTIBODIES
IN HUMAN SERA IN IRAN. ❀**

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INTRODUCTION

Since the initial isolation of adenoviruses from children and military recruits with acute respiratory disease (Rowe, et al 1953; Hilleman and Werner, 1954; Huebner, et al, 1954; Parrott, et al, 1954) thirty-one phenotypes of human adenoviruses have been associated (Gillespie, 1967). These viruses have been associated with various syndromes such as: Pharyngo-conjunctival fever, acute febrile conjunctivitis, pneumonia, in children and adults, gastero.entritis, mesentric adenitis, myocarditis, nephritis and encephalitis (reviewed by Huebner, 1959; Sohler, et al, 1965). The only reported isolation of human adenovirus in Iran is that of Naficy, et al, (1967) who recovered adenovirus type 7 from children affected with kerato-conjunctivitis, pneumonitis and diarrhoea.

Since a serological survey can provide information concerning the existence and incidence of an infection in a population, the present serological study has been carried out to determine the incidence of antibodies to the group-reactive precipitating antigen of adenoviruses in human sera in Iran.

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MATERIALS AND METHODS

Adenovirus antigen and antiserum

Bovine adenovirus type 3 (WBR 1 strain) isolated by Darbyshire, et al, (1965), was used in this study. It was supplied in the form of lyophilized calf kidney tissue culture harvest material by Dr. J.H, Darbyshire, Central Veterinary Laboratory, Weybridge, England. The Virus was serially passaged three times in BHK/21 cell cultures supplied by Dr. A. Hazrati, Razi Institute, Karadj, Teheran. After cytological and serological identification of the virus as bovine adenovirus type 3 in the harvest material from the 1st passage, it was used as antigen in the immunodiffusion tests. The rabbit antiserum to bovine adenovirus type 3 (WBR 1) was also supplied by Dr. J. H. Darbyshire for the serological identification and control immunodiffusion tests.

Serum samples

The human serum samples were obtained from patients referred to workers' Insurance and Khoch Diagnostics Laboratories, Teheran. All the serum samples were stored at -20°C. until examined by immunodiffusion test.

Immuno-diffusion tests

Immuno-diffusion tests were carried out in plates containing agar medium as described by Darbyshire (1962). One per cent agar medium containing 0.15 M NaCl and 0.25 per cent (W/V) phenol buffered to pH 7.2 with 0.1 M Sørensen's phosphate salts, was used in this study. In each plate two sets of wells of 0.6 cm. diameter were arranged hexagonally around a central well of 0.7 cm. diameter, the edge to edge distance of adjacent well was 0.5 cm. The central well was filled with the adenovirus antigen and each of the surrounding wells with the test serums. All the plates were incubated at room temperature (19°C.-22°C.) in a moist atmosphere for 72 hours and then examined for the zone of precipitate under a reflected light from a mirror.

RESULTS

The reaction given by the sera for the presence or absence of adenovirus group specific antibody were considered of a line of precipitation between the adenovirus antigen and the serum under test which is identical with that produced by the rabbit antiserum to bovine adenovirus type 3.

The results of immunodiffusion tests for the presence of group specific antibody of adenoviruses in 322 sera of man are presented in table I. Some of the results of positive human serum samples arranged according to age grouping are shown in table II. No significant difference was demonstrated on account of sex or age.

Table I - Results of Immuno-diffusion Tests for Adenovirus

	Precipitation antibody in sera of human,		
	Total Sera	No. of Positive	Percentage of Positive
Female	158	31	19.6
Male	164	26	15.8
Total	322	57	17.7

Table II- Results of Positive human serum samples according to age groups.

Age (Years)	Percent
Less than 15	16.7
16-45	29.9
Over 45	19.5

DISCUSSION

Adenoviruses possess a group-reactive antigen which is detected by complement-fixation (Hilleman, et al, 1955) and gel diffusion precipitation (Tanaka, 1957; Yin-Coggrave, 1962) test. This antigen has been designated antigen A (Pereira, et al, 1959) or L (Wilcox and Ginsberg, 1961) and contains a group-reactive component together with deoxyribonucleic acid (Pereira, 1960). Serological tests to detect the group specific antibody of adenoviruses are necessarily limited to immunodiffusion of complement-fixation techniques, in which an antigen prepared from any member of the adenovirus group, except the avian strains, can be used (Andrewes and Pereira, 1967). In the present study the bovine adenovirus type 3 was used as antigen for the detection of antibodies in the sera of human. From the results of immunodiffusion tests presented in table I, it is evident that adenovirus infection is widespread among the human population in Iran.

The variation in the percentage of positive serum samples with respect to the age of humans studied (table I) is considered of insignificant value. However, the immuno-diffusion test is generally less sensitive than other serological methods used for demonstration of antibodies to adenoviruses. Thus the overall picture may follow the common pattern of the increase in incidence of antibodies with age (Naito, et al, 1962) if all the requisite antigens are available for neutralization or haemagglutination inhibition tests.

Adenoviruses have been well documented as causal agent of human diseases (Ginsberg and Dingle, 1965; Andrewes and Pereira, 1967; Darbyshire and Roberts, 1968) and the Present study suggests that these agents may be responsible for both frank and inapparent infections amongst human population of this country.

SUMMARY

By immuno-diffusion tests 322 serum samples from human were examined for the presence of antibodies to the group-reactive precipitating antigen of adenoviruses. of the total sera from female, 19.6% and from male, 15.8% had antibody to the group reactive antigen prepared from bovine adenovirus type 3. No significant difference was demonstrated on account of sex or age. The results suggest that adenovirus infection is widespread among the human population in Iran.

RESUME

Les serum sanguins d'un groupe de 322 personnes sont examinés par le test immuno-diffusion avec l'antigène de Adenovirus de groupe-reactive précipitant pour constater les anticorps de l'adeno-virus. Les recherches montrent que 19,6% des hommes et 15,8% des femmes ont l'anticorps adeno-virus 3 du type bovin n'ya pas aucune différence entre les spécimens examinés au point de vue de l'âge et de sexe. en résumé on peut dire qu'en Iran l'infection virale est répandue.

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