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Research article

Outbreak of Echoviruses in middle and south Iraqi provinces

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ABSTRACT

This study included 210 patients with Enteroviral symptoms. All samples were collected from middle and south Iraqi provinces. The highest positive percentage was found in Baghdad (28.8 %). The percentages in the other provinces were 26.7 %, 20 % 20 % and 10 % in Basrah, maysan, Karbala and Wasat, respectively. The lowest percentage was reported in Thy-Kar (8 %). It was found that Echovirus type 11 responsible for 50 % (20 case infected with this type of virus) of infection with Echovirus and this percentage was declined for the following virus, Echovirus 1 (20 %), Echovirus 3 (17.5%), Echovirus 22 (7.7%) and Echovirus 5 (5 %).

Keywords: Echoviruses, Enteroviral, Iraqi provinces

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INTRODUCTION

Echoviruses are grouped together because they infect human enteric tract and because they can be recovered from human only by incubation of certain tissue culture, more than 30 serotypes are known but not all cause human illness [1]. They cause many diseases such as Asptic meningitis, Encephalitis, Fibrile illness with or without rash and common colds [2]. The data from United States had shown that there are at least 10 – 15 million systemic infections annually with non polio-enteroviruses (one of them Echoviruses group) [3].

There are few studies about the epidemiology of this viral group in Middle East [4, 5]. It is impossible in an individual case to diagnose an Echovirus infection on clinically but the diagnosis is dependent upon Laboratory tests [1]. The procedure of choice is isolation of viruses from throat swabs, stools, rectal swabs and aseptic meningitis human fluid, the samples have to culture on special cells line (RD cells line, Hela cells line or others), identification dependent upon serological (Neutralization with specific anti-sera)

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and polymerase chain reaction (PCR) [1]. The epidemiology of Echoviruses are similar to that of other enter viruses and they occur in all parts of the globe and found in the young more than in the old , the most commonly recovered echoviruses world wide in the period (1967 – 1974). The types were 4, 6, 9, 11, and 30. [1]. The present study aimed to present an information about the viral outbreak in middle and southern provinces of Iraq and attempt to know what are the common serotypes.

MATERIALS AND METHODS

Samples

Two to four grams of faces were collected from 210 children and infants who have diarrhea and other symptoms that associate with Enteroviral infection. All samples were collected from AL-Sadar learning hospitals in middle and southern provinces of Iraq period of collection (1-1-2009 to 1-7-2010). All samples were collected from patients less than four years old.

Preparation of faecal samples for virus isolation

Faece was added to 10 ml of phosphate buffer saline (PBS) (pH 7.2, 0.1 M). 1 gm of glass beads and 1 ml of chloroform was also added to each tube. The tubes were closed and shaken vigorously for 20 minutes using a mechanical shaker. All tubes were spun for 20 minutes at 1500 g in a refrigerated centrifuge. Faecal suspensions were stored in deep-freeze at -20 °C till use (6).

Virus isolation

Faecal suspensions were inoculated into tissue culture tubes of RD cells line (cells line derived from human rhabdomyosarcoma). The cells were culture in Eagle's minimum essential medium with Earle's salt solution (MEM) and fetal bovine serum (FBS), were purchased from Sigma, St. Louis, Mo. All cell culture media contained HEPES buffer, L-glutamine, penicillin, streptomycin, gentamicin sulfate, and amphotericin B. Cell cultures were grown in CO2 incubators at 35.5°C and 4.5% CO2. Stock cell cultures were grown in 75-or 162-cm2 plastic flasks (Costar, Corning, N.Y.) with 5 or 10% FBS–MEM. Cultures were read the day after inoculation to check for both cytopathic effects (CPE) and contamination or toxicity problems. If neither of the above were noted, they were read routinely three times per week (Incubation period at least one week).

Identification of the virus (Echoviruses)

Neutralization method was used to identification of Echoviruses, This method was applied in a flat micro titer plate, and specific anti-sera for this virus (WHO Lab.) were used for Neutralization method (6).

RESULTS AND DISCUSSIONS

The highest positive percentage (presence of Echoviruses in patients stool) was found in Baghdad (28.8 %) and this percentage was declined consecutively in the following provinces Basra (26.7%), maysan (20%), Karbala (20%), Wasat (10 %) and the lowest percentage was reported in Thy-Kar (8 %) (**Table 1**).

Table 1. Number of Samples that has many types of Echoviruses and percentage of positive samples from total samples in many Iraqi provinces.

Total sample	Total positive	Percentages
80	23	28.8
15	4	26.7
20	4	20.0
5	1	20.0
40	4	10.0
50	4	8.0
210	40	19.0

Fig. 1 shows the distribution of five types of Echovirus in different middle and south Iraqi provinces. The results showed that the highest number of positive cases of Echovirus (type 11) was found in Baghdad followed by type 22. While, this picture was different in other provinces, such as Wasit and Karbala.

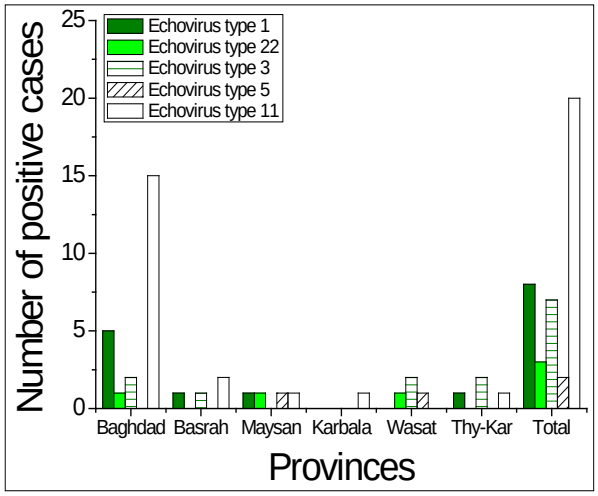

Fig. 1. Number of positive cases of Echovirus types in different middle and south Iraqi provinces.

It was found that Echovirus type 11 responsible for 50 % (20 case has this type of virus) of infection with Echovirus and this percentage was declined for the following virus respectively (Echovirus 1 (20 %), Echovirus 3 (17.5%), Echovirus 22 (7.7) and Echovirus 5 (5 %) (**Fig. 2**).

The cells line that used in isolation of Echoviruses was derived from human rhabdomyosarcoma (RD) because this type of cells has good characteristics to grow and isolate Enterovirus (Echoviruses) as compared with other types of cells [6]. The samples were taken from children and infants because these ages are more sensitive to infect with this virus than other ages [7, 3, 8, 9]. The virus has been isolated from stools instead of other samples because the gastrointestinal tract is the primary site of replication of virus [10]. The total percentage of positive cases in this study is the highest percentage when compared with the same percentages in surrounding countries such as Iran, Saudi Arabia, Jordan, Kuwait and Syria [11]. But this result was very close to the results of high risky (high outbreak of Echovirus) countries such as Afghanistan, Egypt, Pakistan and Yemen [11]. The results of percentage of Echovirus types that shown in this study escort particularly with other results that were presented by other investigators [12].

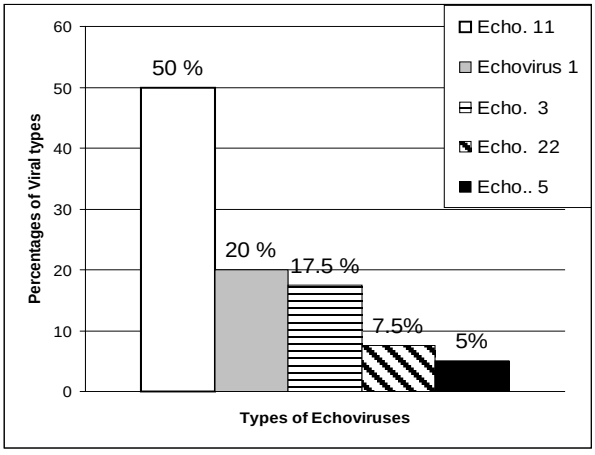

Fig. 2. The percentages of Echoviruses types in all provinces.

It was found in this study the highest positive percentage was found in the crowd provinces such as Baghdad and Basrah and the lowest percentage was found in non crowd provinces such as Thy-Kar and Wasit, which is meaning these viruses are spreading directly from person to person so we can suggest, these types of viruses are transmitted directly and it is being increased in crowd places than non crowd. This conclusion is the same spreading of other enteroviruses these transmitted person to person during cough or sneezing directly in the face of another person and they can be transmitted by contact with feces such as when person changing diapers of infant and toddlers do not wash their hands thoroughly [13]. Echoviruses in children are asymptomatic [12]. The last fact plays an important role in spreading viruses because the person here plays a storage source of shedding viruses to another person and environment. There is no vaccine to prevent the Enteroviruses (Echoviruses) the outbreak that will increase the problem [13]. In future it may be important to interest to develop a rapid method and modern methods to detect viral carries quickly and in high accuracy that will eliminate the sources of virus and reduces the problem.

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Conflict of interest

The author declares that he has no conflict of interests.

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