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Risk Factors for Varicella Prevalence Among Primary School Children in Al-Dora City (Southern Baghdad)

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Abstract

Chickenpox is a viral disease caused by a virus called *varicella zoster* (VZ). Chickenpox cases were counted in Al-Dora city (southern Baghdad). Data of disease was obtained from the records of Bilat Al-Shuhadaa health center at the period from January to July 2012. Diagnosis of cases was achieved by the physicians of the health center. Studied risk factors were including the gender, address, school and age. Total of cases recorded was 73 cases (66.9 per 100,000) populations for seven months. Males reported cases were 48 (65.7%) while female's cases were 25 (34.3%). The highest reported cases were signed in Al-Mhdia-1 sector (24.6%). Also highest reported cases were signed in Al-Mhdia primary school (17.8%). Most VZ cases were reported in the age group of (7-10) years (49.3%). The aim of the study is to determine the occurrence of chickenpox cases in Al-Dora city and try to know the causes of disease prevalence.

Keywords: Chickenpox, primary schools, southern Baghdad.

عوامل خطورة أنتشار جدري الماء بين أطفال المدارس الابتدائية في مدينة الدورة جنوب بغداد

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الخلاصة

جدري الماء هو مرض فايروسي يتسبب بواسطة فايروس يسمى (*Varicella zoster* (VZ). أخصيت حالات جدري الماء في مدينة الدورة جنوب بغداد. تم الحصول على معلومات المرض من سجلات مركز بلاط الشهداء الصحي للمدة من كانون الثاني الى تموز عام 2012. تم تشخيص للحالات المرضية من قبل أطباء المركز الصحي. عوامل الخطورة التي تم دراستها شملت الجنس والعنوان والمدرسة والعمر. العدد الكلي للحالات المسجلة كان 73 حالة (66.9 لكل 100,000 نسمة) لسبعة أشهر. الحالات المسجلة لدى الذكور كانت 47 حالة بنسبة (65.7%) بينما الحالات المسجلة لدى الاناث كانت 25 حالة بنسبة (34.3%). أعلى حالات مسجلة أشرت في حي المهديّة الأولى (24.6%). كذلك أعلى حالات مسجلة أشرت في مدرسة المهديّة الأولى الابتدائية (17.8%). أغلب حالات جدري الماء سجلت في الفئة العمرية (7-10) سنوات (49.3%). الهدف من الدراسة هو قياس حدوث حالات جدري الماء في مدينة الدورة ومحاولة معرفة أسباب انتشار المرض.

Introduction:

Chickenpox or Varicella is a viral disease caused by a virus called *Varicella zoster* (VZ). The disease is more prevalent among children less than ten years [1]. In most times the disease be simple and do not cause death, more than 95% of adult person was infected with chickenpox in their childhood life. In non-vaccinated populations, primary infection tends to occur at a younger age while

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in adults may be more severe. *Varicella* may infect different mammals such as horses, monkeys, rabbits, sheep and cows [2].

Sometimes the virus which cause chickenpox disease may cause encephalitis, pneumonia, persistent sequel and death. Secondary infections of the vesicles may cause disfiguring scars, necrotizing fasciitis, and septicaemia [3].

Chickenpox has high infection and distributes by olfactory secretions or by direct contact to skin bumbled. Chickenpox is considered a monthly noticeable disease in Iraq. The infection of varicella appears in winter and spring, but it may see at any time of the year [4]. Chickenpox is more fatal in pregnant women than in the non-pregnant adult as five times [5]. The virus of varicella enters the body of human and need 11-12 days to revile the symptoms. The symptoms of chickenpox represented by a rash in thoracic and abdomen, then distribute to the face, arms and legs within two or three days [6]. The rash contains the transparent solution which curt to be dry covers. The rash is accommodating with hard itch [7].

The diagnosis of disease is clinical. Clinical cases attending the primary health care centres all over the country are reported to the surveillance section in Communicable Disease Control Centre. Management is usually supportive. But, data regarding hospitalization and death are lacking [8].

The explosion of bumbled by the child may cause bacterial infection or an effect that may stay over his life. However, to avoid these effects the nails must be cutter always, using special cream decrease the itch [9]. Complications are appearing with chickenpox represented by bacterial infection of skin, lung infection, meningitis and brain infection in child less than one year [10]. Adults may affect at chickenpox, in this case the disease will be strong and the symptoms continue for long period [11]. Vaccination of chickenpox has no negatively affects except pain and redness of vaccine position [12]. Some researchers were reported that the distribution of Chickenpox varies in different geographical zones such as Baghdad, Ninawa, Dihok and Basrah provinces of Iraq [13].

The aim of this study is to monitor the monthly distribution of VZ in Al-Dora sectors and the analysis of its causes.

Methodology

Description of study area

The city of Al-Dora is located in the southern region of Baghdad at coordinates (39°51'41) longitude and (18°43'15) latitude. It extends along the east side of the Tigris river. It has an area of (2,343) km² and a population of (109.028) inhabitants, (84,541) living in the urban area and (24,487) in the rural area.

Collection of data

Statistical information of chickenpox was collected from Bilat Al-Shuhadaa health centre in Al-Dora southern Baghdad. The collection of data was from January to July 2012 weekly. The statistical information includes the name of patient, sex, age and date of infection. The diagnosis of cases was depended on the physicians of the health center.

Age classification used in the study was as follows:

1. First group (1-3) years.
2. Second group (4-6) years.
3. Third group (7-10) years.
4. Fourth group (up to 10) years.
5. Fifth group, non-limited (missing data from the source).

Sectors of study area

Six sectors of Al-Dora were included in this study as:

1. Al-Mhdia/1.
2. Al-Mualimeen.
3. Al-Eskan.
4. Al-Mhdia/2.
5. Arab Jubor.
6. Al-Athorieen.

Fourteen primary schools of Al-Dora city was included in this study as:

1. Gareer.
2. Al-Gazira.
3. Bilat Al-Shuhadaa.

4. Al-Kolud.
5. Fjr Al-Islam.
6. Al-Eskan.
7. Al-Mhdia.
8. Al-Thnaa.
9. Al-Huraa.
10. Umar IbnAbdal-Aziz.
11. Al-Karama.
12. Al-Raia.
13. Al-Nahda.
14. Saif Allah.

Results and Discussion

VZ with sex

Total chickenpox reported cases that imported to Al-Shuhadaa health centre within seven months were (73) cases (66.9 cases per 100000 people). The number of samples is little, but, the incidence rate of disease in limited population is rise. Female infection cases were less than male infection cases t-test (3.174). Male infection reported cases were (48) cases represented (65.7%). Female infection reported cases were (25) cases represented (34.3%) from the total cases Table-1.

Table 1- Numbers and percentages of male and female cases of chickenpox recorded in Bilat Al-Shuhadaa health centre.

Sex	No. of cases	Percentage
Male	48	65.7
Female	25	34.3
Total	73	100

According to a recent study, the occurrence of varicella in Iraq was 66.9 per 100,000. This result was less than those in other countries as Turkey (466-768 per 100,000 children) [14]. Also the incidence rate of disease in Iraq was less than in Italy (6136.8/100,000 person) [15]. As well as the recorded rate was less than other countries of the world such the Taiwan (540 cases per 100,000) [16] and Japan (762.2 per 100,000 persons) [17].

The results of the current study were agreed with studies where suggested that the incidence rate of disease in Iraq is lower than that reported in temperate countries [18]. Also same think in tropical countries of the world [19]. Furthermore, the incidence rate of chicken pox in Iraq is lower than in Iran [20].

Recent findings were supported by a study in the Diyala province of Iraq which found that the percent of male infection with VZ was 10.09 %while in female was 6.51%, but the cause is not reported [21]. Distribution of VZ cases is depending on the gender of the patient. This might be attributed to the social habits of Iraqi community, such as attachment with people or animals represented the source of infection and working [22].

There are many differences between males and females in susceptibility to infections due to many factors. The main cause may be due to innate physiological differences between males and females. Also gender specific differences appear to be dependent on the virus causing the infection, as not every infection with a specific microbial type result in increased susceptibility of one gender over the other. Abstractly, there is interaction between gender specific immune differences from side and the specific immune response from other side [23, 24].

VZ with Sectors

The highest reported cases were observed in the sector of Al-Mhdia/1 which were (18) cases represented (24.6%) of the total cases. Also high reported cases were observed in Al- Mualimeen sector that were (12) cases represented (16.4%) of all reported cases t-test (2.352). While the lowest reported cases were observed in Al-Athorieen, which were one (1) case only within seven months (1.3%) Table-2.

Table 2-Total and percentages of cases in different sectors of Al-Dora

Sectors of cases	No. of cases	Percentage
Al-Mhdia 1	18	24.6
Al-Mhdia 2	3	4.1
Al-Mualimeen	12	16.4
Al-Eskan	4	5.4
Al-Athorieen	1	1.3
Arab Jubor	2	2.7
Unrecorded	33	45.2
Total	73	100

Six sectors of Al-Dora are arranged according to highest VZ cases as Al-Mhdia/1>Al-Mualimeen> Al-Eskan> Al-Mhdia/2> Arab Jubor and Al-Athorieen. Thirty-three (33) chickenpox cases which recorded without address were used in analyses the age, gender and date of infection Table-2.

In Iraq, Geographic distribution of chickenpox cases was recorded by a study in some Northern provinces such as Ninawa (26,000 cases for 4 years), Duhok (24,000 cases for 4 years), AL-Sulaimanya (19,000 cases for 4 years); Central province, Baghdad/Russafa (245,000 cases for 4 years) & Karkh (21,000 cases for 4 years) and Southern provinces such as Al-Basrah (20,000 cases for 4 years).The occurrence of varicella in Iraq is depending on geographic distribution. This occurrence is affected by climatic nature of country, virus survival, virus infectivity and case registration [4]. It has been found the transmission of the virus is reduced in the humid, hot climates [25].

VZ with age distribution

Highest VZ cases were observed in the age group of three (7-10) years, which were (36) cases (t-test was 2.571), represented as (49.3%). Lowest VZ reported cases were observed in the age group of one (1-3) years, which were (3) cases, represented as (4.1%). Fifteen VZ cases were recorded without documenting of patients age Table-3.

Table 3- Numbers and percentages of age distribution affected with chickenpox in Bilat Al-Shuhadaa health center.

Age distribution (year)	No. of cases	Percentage
1-3	3	4.1
4-6	10	13.6
7-10	36	49.3
Up 10	9	12.3
Unrecorded	15	20.5
Total	73	100

To now varicella is still a highly common childhood disease and may become more severe with age [26]. School children are a victim and target of varicella because of weakened of the immune system in childhood may cause severe illness and even death [2].

The results of the current study were supported with other studies which reported that the severity and complications of varicella are increased among immunocompromised persons, children younger than 1 year of age, and adults [27- 29]. However, healthy children and adults may die because of developing and complications of varicella [30-33].

A recent study was agreed with a study was shown that most of the cases of varicella were occurred in the age group 5-14 years with percent (65%) [34]. Prevalence of varicella among school children may be due to poor hygiene, social habits, and the chickenpox vaccine is not in program of Iraqi immunization [35].

Furthermore, children have no safety behaviours to protect themselves against the disease. The child may itch the bumble of varicella by his nails causing spreads of bumbles.

VZ with schools

Fourteen (14) primary schools distributed in different sectors of (Al-Dora city) were sending their students to Bilat Al-Shuadaa health center. Highest VZ reported cases were noticed in Al-Mhdia

primary school, which were (18) cases, represented as (17.8%) of all cases, then Al-Thnaa primary school which were 10 cases (13.6%). Lowest infection cases of VZ were reported in six primary schools which were one case only (1.3%) Table-4.

Table 4- Numbers and percentages of chickenpox cases recorded in the schools of Al-Dora city.

Schools record cases	No. of cases	Percentage
Al-Mhdia	18	17.8
Al-Thnaa	10	13.6
Al-Huraa	3	4.1
Umar Ibn Abdal-Aziz	9	12.3
Garer	1	1.3
Al-Raia	2	2.7
Al-Gazira	1	1.3
Al-Karama	5	6.8
Bilat Al-Shuhadaa	1	1.3
Al-Kulod	1	1.3
Fgr Al-Islam	1	1.3
Al-Nahda	2	2.7
Saif Allah	2	2.7
Al-Iskan	1	1.3
Un-recorded	16	21.9
Total	73	100

Six (6) primary schools were equaled in VZ that reported (one) case there were: Gareer, Al-Gazira, Bilat Al-Shuhadaa, Al-Kolud, Fjr Al-Islam and Al-Eskan. (Table4). Outbreaks of varicella in schools and other child care centres may occur suddenly.

Prevalence of varicella among school children may correlate with many causes as mass vaccination to uninfected persons [36], lack of rabid identification, the epidemiological situation of disease [37], deficiency of care facilities [2], doesn't let children to stay home until the skin has completely cleared, unreported of evidence of immunity to varicella [8].

VZ with months

Highest infection cases of VZ were reported in January which were 35 cases (66%) then in February which were 20 cases (27.2%) then in March which were 18 cases (17.8%). In cold winter months, VZ cases were appearing and they disappear in the summer months. The lowest infection cases of VZ were reported in the months April, May, June and July 2012 which were (zero) Table-5.

Table 5- Monthly reported numbers and percentages of chickenpox cases in Al-Dora city.

Months	Number on VZ cases	%
January	35	66
February	20	27.2
March	18	17.8
April	0	0
May	0	0
June	0	0
July	0	0
Total	73	100

In tropical countries the epidemiology of varicella is different. In these areas a higher proportion of cases occur among adults [2].

From this study, varicella was appeared in winter months and disappeared in the summer months. Seasonal distribution of varicella was reported by other studies which shows that the start of rising cases in December and January.

A recent study was similar to previous studies in Iraq that recorded the low number of varicella in April and May in 2007 (4000 cases in April and May) [4]. Also, this finding is similar to was reported in India [25], and Saudi Arabia [38].

Geographical distribution of varicella in Iraq might be attributed to many causes such as dry hotness of climate, the survival of the virus, infectivity of the virus and the registration of the cases [4]. However, there were some limitations of this study such as small size of the sample, lack of data (history of infection, vaccination situation, immune testes and infants recording), locality of study, duration of study and epidemiological situation.

Conclusion

Based on what has been mentioned before, the following are recommended:

1. A national survey for the prevalence of markers of infection with *Varicella zoster* should be conducted.
2. Establishment of case based surveillance of chicken pox cases and report any (hospitalization, complications and deaths) caused by chicken pox in order to determine the burden of the disease in the country. The use of laboratory confirmation of cases is essential, especially for the high risk groups.
3. Surveillance of chickenpox cases among pregnant women and immune compromised patients in order to plan management for chickenpox during pregnancy and the need for varicella immunoglobulin.
4. Collaboration with the ACIP (American Council for Immunization Program) to put a clear plan of introducing the chickenpox vaccine into the immunization program in Iraq after complete understanding of the real epidemiological situation of the disease in Iraq.

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