Incidence of Mumps in Anbar province, West of Iraq during the Period 2009-2018

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Summary

Background: Mumps (infectious parotid gland) is an infectious viral disease mainly affects children and adolescents characterized by enlargement of parotid and salivary glands, other epithelial tissues may be affected, in some cases it is accompanied by serious complications. In recent years many mumps cases in Anbar province have appeared in people who have been vaccinated with Mumps vaccine and for reasons that are not clear

Objective: To Show the annual mumps incidence with age groups and sex for those affected in Anbar province

Methods: A Descriptive cross-sectional study of the electronic archives of mumps patients who were immediately registered in Anbar Governorate hospitals, during the period from 2009 to 2018. The questionnaires regarding year of infection, gender, and age of mumps patients included in the study. Mumps incidence has been calculated through dividing the number of annual cases of infection by population size multiplied by 100,000. SPSS software version 24 were used for data analysis.

Results: Of 2924 Mumps patients registered at Anbar province hospitals, 1715 (58.7%) were males with 12.1 ± 4 years mean age . The incidence rates of Mumps in 2009, 2010, 2011, 2012, 2013, 2014, 2015,2016,2017 & 2018 were (0.50, 0.20, 0.70, 0.80, 1.70, 0.00, 0.00, 7.20, 97.90& 59.00) / 100,000 respectively with statistically variance among males & females; p value = 0.000 & annual incidence ratio was 21.00 / 100,000. Annual Mumps incidence ratio from 2009-2018 confirmed one peak in 2017-2018 & a rare 2009-2016, Majority of them were in the age group 5 to14 years old.

Conclusion: Mumps incidence had been increase during the last 2 years mainly in the age group 5 to14 years old with a marked increase incidence in male in Anbar province, Iraq.

Keyword: *Incidence, Mumps, Years, Gender, Age Group, descriptive study Anbar, Iraq*

Introduction

Mumps (infectious parotiditis) is a contagious virus of the family paramyxoviridae, an enveloped single negative non-segmented RNA virus [(1)]. Mumps is a childhood and adolescent disease characterized by an enlarged parotid and salivary glands with other epithelial tissues, sometimes accompanied by more serious complications, including Orchitis that may be lead to Sterility and aseptic meningitis, up to 10% of mumps patients developed aseptic meningitis may lead to disability or death, and permanent deafness and sometime pancreatitis [(2)]. Rare symptoms include

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, oopheritis mastitis, arthritis, and myocarditis [3]. especially in adults with serious complications [4].

Mumps is a highly contagious viral transmitted through respiratory droplets or direct contact mainly during the winter [2, 5].

Mumps prevented mainly through the use of live attenuated vaccines consisting of a mixture of mumps, measles and rubella vaccine known as MMR vaccine [6, 7]. However, within a few years after the implementation of the routine vaccination program against mumps, a large and small mumps epidemics began to appear around the world, including in people vaccinated against this disease [8 ,9, 10 ,11]. Infectious mumps disease is common in middle and lower income countries such as Iraq and this disease is a neglected health problem where the clinical documentation of it is not at the required level despite the seriousness of its complications as well as rare epidemiological studies about it [12]. Current work were design to determine the mumps Incidence rate in Anbar province, Iraq during the period 2009-2018.

Materials and Methods

Descriptive cross-sectional study of Mumps patient's electrical files that recorded immediately at Anbar province hospitals. All newly diagnosed Mump cases data was retrieved from each of public, private hospitals along with Pediatrician private clinics. Electronic database saved in Al-Anbar Health Office during a period from 2009-2018 includes demographic variables with sero-diagnosis by recognition of ″mumps-specific IgM ″ in a serum sample [13]. Mump diagnosis was confirmed by at least two specialized doctors consultants in medicine according to WHO standard criteria [10].

Estimates of the population of Anbar were taken from the statistics section of the Iraqi Ministry of Planning for 2018 and previous years for the study. Of total, 2924 Mump patients were included in this study, the incidence rates are expressed per 100,000. Ethical approval had been obtained from anbar medical college Ethics approval Committee,Iraq.

Statistical Examination

Annual incidence rate was calculated by dividing the total number of newly diagnosed mumps cases in a given year by the population at risk of mumps in the Anbar Governorate this year and the result is multiplied by 100,000, As it was considered population of all ages the risk of Mump infection. The SPSS 24 program version was used to analyze the qualitative data as the ratio of males to females, age group and mumps patients annual frequencies and to determine whether there was a statistical difference within these variables through Chi-Square test and a statistically significant study when the value of $P < 0.05$.

Results

Total number of ascertained Mumps cases that recorded was 2924 during a period from2009-2018. Of them, 1715 (58.7%), 1209 (41.3%) were males and females respectively with 1.4:1 male to female ratio. Significant difference had been recorded between males & females infection (p value ≈0.000). Mean age of Mumps cases was 12.1 ± 4 year. Mean age of recorded cases of Mumps was significantly slightly higher in males compare with females, 12.1 ± 2 & 12.2 ± 6 years respectively.

Mumps incidence over years 2009 to 2018 by gender is illusterated in Table 1.

Table 1: Distribution of Mumps over years 2009 to 2018 by Gender in Anbar province, Iraq

Year	Gender		Total (%)	P. Value
	Female (%)	Male (%)		
2009	2 (28.6)	5 (71.4)	7 (100)	0.000
2010	3 (75.0)	1 (25.0)	4 (100)	
2011	5 (45.5)	6 (54.5)	11 (100)	
2012	3 (25.0)	9 (75.0)	12 (100)	
2013	18 (64.3)	10 (35.7)	28 (100)	
2014	0 (00.0)	0 (00.0)	0 (00.0)	
2015	0 (00.0)	0 (00.0)	0 (00.0)	
2016	55 (43.3)	72 (56.7)	127 (100)	
2017	636 (37.6)	1054 (62.4)	1690 (100)	
2018	487 (46.6)	558 (53.4)	1045 (100)	
Total	1209 (41.3)	1715 (58.7)	2924 (100)	

The incidence rates of Mumps in 2009, 2010, 2011, 2012, 2013, 2014, 2015,2016,2017 & 2018 were (0.50, 0.20, 0.70, 0.80, 1.70, 0.00, 0.00, 7.20, 97.90& 59.00) / 100,000 respectively with statistically variance among males & females (p value ≈ 0.000). Annual Mumps incidence rate was 21.00/ 100,000. The drift in annual Mumps incidence rates from 2009 to 2018 confirmed one peak in 2017-2018 with a rare incidence during 2009-2016. No Mumps cases was recorded during a period 2014-2015 due to the displacement of most of the population from the Anbar province as a result of terrorist operations to other provinces as illusterated in Table 2, Figure 1.

Table 2: Mumps with Yearly Annual Incidence per 100000 population with confidence interval 95% from 2009 to 2018 in Anbar province, Iraq.

Year	Pearson-year at Risk	Number of patients (%)	Overall Annual Incidence per 100,000 person year	Standerd deviation
2009	1478226	7 (0.2)	0.50	38.50764
2010	1660123	4 (0.1)	0.20	
2011	1562025	11 (0.4)	0.70	
2012	1600000	12 (0.4)	0.80	
2013	1636861	28 (1.0)	1.70	
2014	1753968	00 (0.00)	0.00	
2015	1750000	00 (0.00)	0.00	
2016	1769230	127 (4.3)	7.20	
2017	1665000	1690 (57.8)	97.90	
2018	1791390	1045 (35.7)	59.00	
Total		2924 (100.0)	Annual average 21.00	

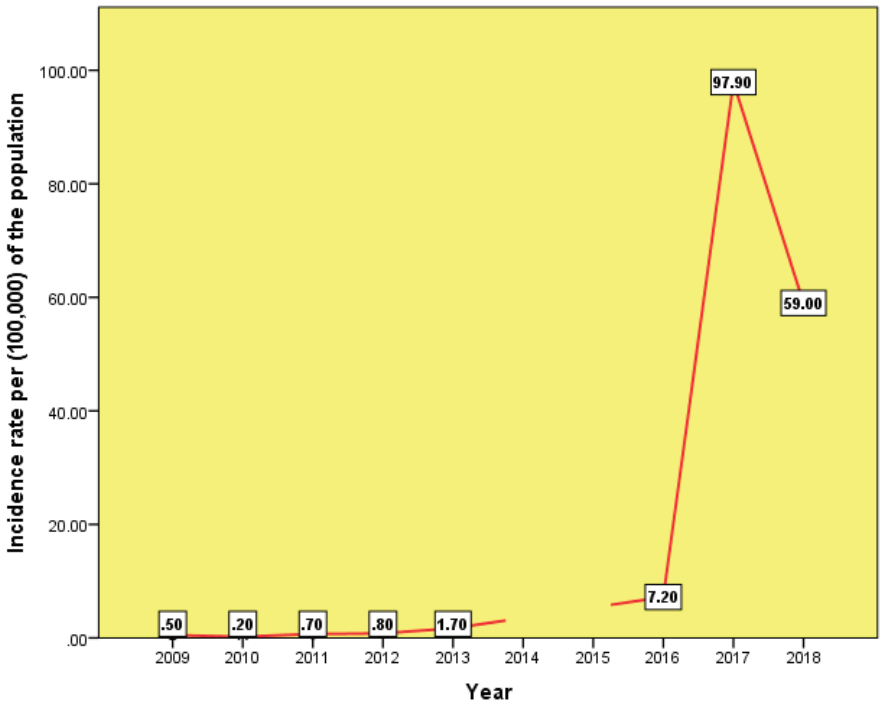

Figure 1: Yearly Mumps Annual Incidence per 100000 population during 2009 to 2018 in Anbar province, Iraq.

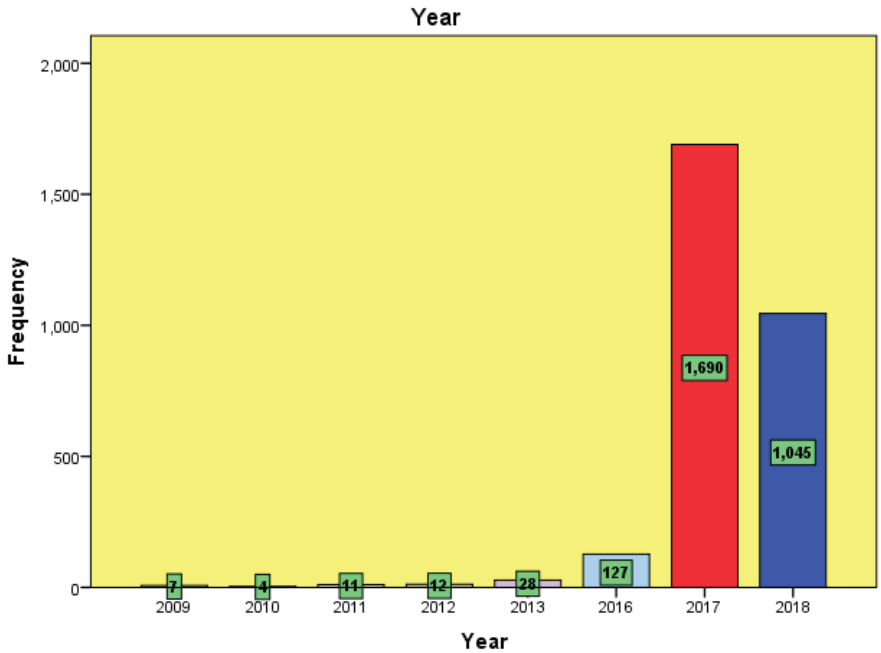

Figure 2: Frequency of Mumps over years 2009 to 2018 in Anbar province, Iraq

Mumps patients were classified according to age into 3 groups; (1):1–*4* years, (2): 5–14 years and (3): 15–45 years) For each year of study that conducted during a period from 2009-2018. Majority of Mumps patients were in the age group 5 to14 years old that had highest relative increase of incidence as presented in Table 3, Figures 3. Mean age of recorded cases of Mumps was 12.1 ± 4 year. Study showed that there was a statistically significant difference between the different age groups of Mumps during each of the study years (P.Value:0.000).

Table 3: Distribution of Mumps over years 2009 to 2018 by Age Group in Anbar province, Iraq

Year	Age group			Total	P.Value
	1-4 Year N (%)	5-14 Year N (%)	15-45 Year N (%)		
2009	2 (28.6)	4 (57.1)	1 (14.3)	7 (100.0)	0.000
2010	1 (25.0)	2 (50.0)	1 (25.0)	4 (100.0)	
2011	4 (36.4)	5 (45.5)	2 (18.2)	11(100.0)	
2012	2 (16.7)	6 (50.0)	4 (33.3)	12(100.0)	
2013	5 (17.9)	15 (53.6)	8 (28.6)	28 (100.0)	
2014	0 (0.00)	0 (0.00)	0 (0.00)	0(100.0)	
2015	0 (0.00)	0 (0.00)	0 (0.00)	0(100.0)	
2016	9 (7.1)	87 (68.5)	31 (24.4)	127 (100.0)	
2017	211 (12.5)	1058 (62.6)	421 (24.9)	1690 (100.0)	
2018	29 (2.8)	913 (87.4)	103 (9.9)	1045 (100.0)	
Total	263 (9.0)	2090 (71.5)	571 (19.5)	2924 (100.0)	

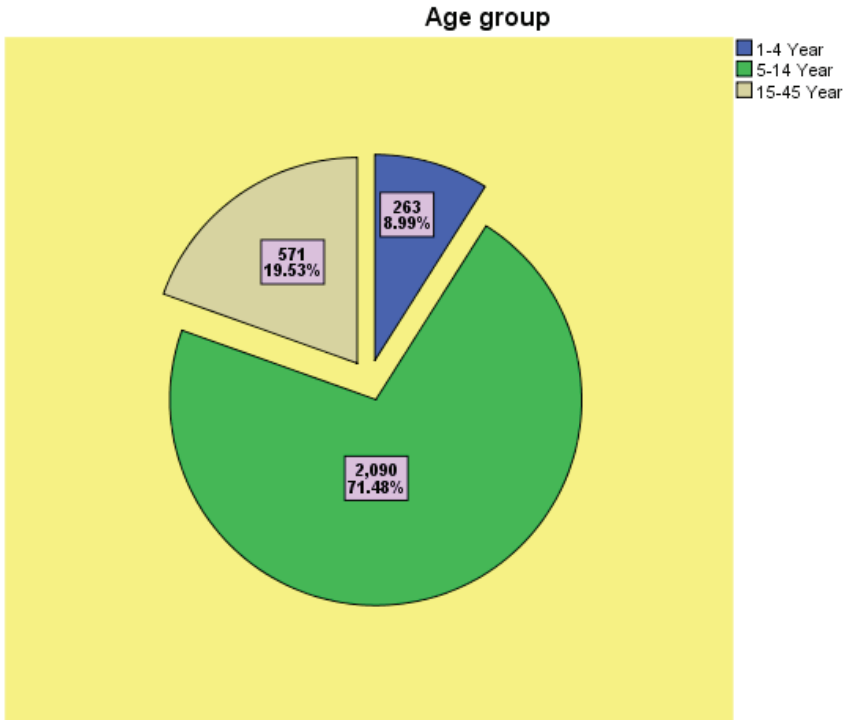

Figure 3: Distribution of Mumps over years 2009 to 2018 by Age Group in Anbar province, Iraq

Discussion

The total number of ascertained mumps cases that were recorded in Anbar Governorate during the period 2009-2018 was 2924 cases as shown in Table 1. Increase mumps cases in the past two years 2017-2018 in Anbar Governorate may be due to the advancement of the health sector, which causes many patients to seek health care, whoever increase mumps incidence may due to vaccines lacking. Lose mumps in the years 2014, 2015 and 2016 may be that most of the Anbari community has been displaced and displaced to other regions inside and outside Iraq due to the military operations, due to which health institutions have lost the ability to follow up on this disease as shown in Table 2, Figure 1

The average annual mumps incidence in Anbar population during the present study (21.00 / 100,000 persons) was much higher than that of the same disease recorded in neighboring countries such as Saudi Arabia [14], Turkey [15] and Egypt [16] in addition to other countries as Italy ,France, western Europe [17 ,18], Japan [19], this rise may be due to a lack of vaccines for this disease in Iraq and with that the result is similar to the result obtained in previous studies in Iraq, where in 2016 ,73919 cases were recorded, while 36367 cases were recorded in 2017, while the number of mumps cases in 2017 worldwide reached about 467506 cases according to world health organization 2019 [20].

The mean age of recorded mumps cases during the current study was 12.1 ± 4, and this contrasts with the mean age of children with mumps that was shown by previous studies in Saudi Arabia [14], Egypt [16] and Jordan [18], It was showed that child in the age group 5-9 years were more likely to mumps.

The current research showed that age group 5-14 is the main target age group for mumps, followed by age groups 15-45 and 1-4 years, and this result is similar to the result obtained in previous studies [21, 22, 23] that showed that the age group 5-14 is more susceptible to infection with this disease and is very close One of the results obtained from a similar study in Tehran [24], where children were in the age groups 0-9 or 5-9 years are more susceptible to mumps infection, as well as completely identical to a previous study in USA [5], where it appeared that 90% of children with mumps are are under 14 years of age ,in contrasts with a previous study in Belgium, it confirmed that the age group 3-12 years is more susceptible to mumps and also differs greatly from other studies that showed that the 35-44 age group was the target of mumps [25].

The current study showed that the prevalence of mumps in males 1715 (60.1%) and females 1209 (41.3%) out of a total of 2924 cases during the period of study, which confirmed the presence of a relative majority of males with this disease and this similar to the previous study that shows mumps illness happend more commonly in males with about 2: 1[11] ,It also consistent with the results of Sweden study that showed 62% mumps patients were male, and consistent with the result of Quasim (2010) [26] in Iraq where it was found high mumps incidence in males compare with females, as other studies that shows a bias for male cases of mumps [22] , [27],whereas current study was different from a previous study conducted in Germany while it showed that only 43.3% of mumps patients were male [25].

The conservative nature of Iraqi society makes females less mixed, and therefore less susceptible to mumps though respiratory droplets. In addition to mixing, other male activities, such as travel, social differences and other important activities, increase the risk of male mumps infection.

The current study showed that there is a noticeable increase in the mumps incidence during the last three years, especially age group 5-14, and therefore it is necessary to vaccinate children with the mumps vaccine due to the severity of complications of this disease if it occurs.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

Conflict of Interest: Non

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