

Evaluating the prevalence measles virus IgM antibodies for under 2 years children in Diayala governorate

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Abstract

The goal of present study was to evaluating the prevalence of measles virus (MV) immunoglobulin M antibodies in children under two year. This study was conducted from the period from 1 / 5 / 2015 to 30/ 2 / 2016. It included; Sera of 163 from children, 91(55.8%) from children aged (0-8) months and 72(44.2%) from children aged (9-23) months were collected from Al-Batool teaching Hospital. Detection of anti-measles IgM antibody was done by Enzyme – linked immunosorbent assay in the Center Public Health Laboratory. The seroprevalence of measles virus IgM obtained in this study 35(21.5%) were anti-MV IgM positive and 128(78.5%) children were anti-MV IgM negative. Additionally positivity of measles virus infection (28.2%) among children aged (0–8) months, and (12.5%) among children aged (9-23) months .Moreover the sero-prevalence of IgM was 5 (10%) among males and 30 (26.5%) among females. Furthermore, the prevalence of IgM 5(6.9%) among vaccinated children, on other hand 30(32.9%) among unvaccinated children. As well as, the Positivity of IgM 12 (11.2%) in Children of mothers with vaccinated or a past history of measles, While 23 (41%) among children of mothers with unvaccinated or no a past history of measles. Finally, the prevalence of IgM was 2(2.6%) in children who were breast feeding, but 33(37.9%) among non-breastfeeding children. **In conclusion**, the prevalence of anti-MV IgM was higher among aged (0–8) months. For the more, the prevalence of IgM was higher among females. Additionally prevalence it's higher among unvaccinated children. While prevalence its higher among children of mothers with unvaccinated or no history of measles. Finally, the prevalence it's higher among non- breastfeeding children.

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Key words: Measles virus (MV), IgM, ELISA, under 2 years Children

تحديد انتشار الضدات النوعية IgM لفيروس الحصبة المختلطة للأطفال تحت عمر 2 سنة في محافظة

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الخلاصة

الهدف من الدراسة الحالية هو تقييم انتشار الضدات النوعية IgM لفيروس الحصبة المختلطة (Measles virus) بين الأطفال تحت عمر سنتين. أجريت الدراسة الحالية لفترة من 2015|5|1 إلى 2016|2|30، حيث تم جمع 163 عينة دم من الأطفال وكانت الأعمار متراوحة من (9-23) شهر وبعدها قسمت إلى مجموعتين المجموعة الأولى من (0-8) شهر وبنسبة (55.8%) و91 والمجموعة الأخرى من (9-23) وبنسبة (44.2%) 72. جمعت العينات من مستشفى البتول التعليمي. حددت الضدات النوعية IgM لفيروس الحصبة باستخدام تقنية الأنزيم المرتبط المناعي (الليزا) في مختبر الصحة المركزي. أظهرت النتائج انتشار الضدات النوعية IgM الموجبة (21.5%) و35 والسالبة (78.5%) 128 بين الأطفال. ومن جهة أخرى فان معدل انتشار المرض بين الأطفال الذين أعمارهم ما بين (0-8) وبنسبة 28.2% أعلى من الأطفال الذين أعمارهم ما بين (9-23) شهر وبنسبة 12.5%. وبالإضافة إلى ذلك فان معدل انتشار المرض في الإناث وبنسبة 26.5% أعلى من الذكور وبنسبة 10%. ومعدل انتشاره بين الأطفال غير ملقحين وبنسبة 32.9% أعلى منه في الأطفال الملقحين وبنسبة 6.9%. ومن ناحية أخرى فان معدل انتشاره في الأطفال الذين يعتمدون على الرضاعة الاصطناعية وبنسبة 37.9% أعلى منه من الأطفال الرضاعة الطبيعية وبنسبة 2.6%. ومعدل انتشاره بين الأطفال الذين أمهاتهم ليس لديها تاريخ قديم بالإصابة بمرض الحصبة وغير ملقحات ضد المرض وبنسبة 41% أعلى من الأطفال الذين أمهاتهم لديها تاريخ قديم بالإصابة وملتحات وبنسبة 11.2%.

الكلمات المفتاحية: فيروس الحصبة، الليزا، الأطفال تحت عمر 2 سنة، الضدات النوعية

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Introduction

Measles remains a major public health problem, Measles viruses is the cause of measles diseases, measles virus (MV) belongs to the family Paramyxoviridae, of the genus Morbillivirus. This virus is a single stranded RNA (SSRNA molecule of negative sense), Spherical, enveloped consists of haemagglutinin protein and the fusion embedded in the lipid bilayer. (1, 2).

Measles is an antigenically stable virus. There is one serotype only and there are very little differences between different isolates (3). Measles is more wide spread distribution in developing countries (4, 5, 6). The World Health Organization (WHO) report 30,000,000 new cases of measles in developing countries (7, 8, 9). Measles has been eliminated in western countries by aggressive style (10,11). In Africa 220,000 cases of measles among children less than five years. (12). The disease is characterized by an incubation cycle of 10-11 days, the patient enters the prodromal, fever, malaise, catarrh of upper respiratory tract, sneezing, conjunctivitis and cough (13). Koplik's spots, which are pathognomonic for measles, appear on the buccal and labial mucosa opposite the lower molars. It appears about 4 days after exposure and starts behind the ears and on the forehead (14). Measles is transmitted principally from person to person by big respiratory droplets, but can as well be broadened by aerosolized droplets, as well as adjacent personal contact or direct contact with nasal or throat secretions from ill persons (1). discovery of IgM antibodies to Measles viruses is as a rule performed by Enzyme-linked immunosorbent assay (ELISA) and the indirect immunofluorescence test (IIFT). The measles IgM ELISA is more speedy and responsive for serological analysis of measles disease than other tests (15), and finding of measles virus (MV).

RNA by nested real-time PCR (16). goal of present study was to evaluating the prevalence of measles virus (MV) immunoglobulin M antibodies in children under two year

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Material and methods

The present study was conducted in Diayala governorate for the period from 1 / 5 / 2015 to 30 / 2 / 2016. It included; 163 sera sample from children under 2 years ,91 as of children (0-8)months and 72 as of children aged (9-23) months were collected from Al-Batool teaching Hospital. Detection of IgM antibodies to Measles viruses was done using ELISA techniques in the Center Public Health Laboratory .

Collection of serum specimens

From each personality in this study, 2 ml of blood was strained by vein penetrate by throwaway syringes. The blood was located in plastic disposable tubes; it was gone to place at room temperature (20- 25°C) to let it to clot, then the sera was separated by centrifugation 10000 rpm for 5 minutes and stored at -20°C till examination. The specimens were transferred to the Virology Unit / Public Health Laboratory in Baquba for discovery of IgM antibodies to Measles viruses in serum specimens through ELISA test. All sera specimens and reagents were allowable to place at room temperature previous to employ in the analysis.

Detection of Measles virus

Measles virus IgM (serum) ELISA test: This test was performed using commercially available kit (Measles IgM ELISA Test Kit). Reactive results were indicated by the absorbance reading of 1.1 and above, while the non-reactive results were indicated by the absorbance reading less than 0.9.

Principle test: The IgM antibodies to Measles viruses EIA analysis Kit is a solid stage enzyme immunoassay accorded on indirect standard used for the qualitative and quantitative discovery of IgM antibodies to Measles viruses in human plasma or serum. The micro well plate is covered with MV antigen. During testing, the specimen diluents and the specimens are additional to the antigen covered micro well plate and then incubated. If the specimens contain IgM antibodies to MV, it well binds to the antigens covered on the micro well plate to form immobilized antigen-MV IgM antibody complexes. If the specimens do not contain IgM

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antibodies to MV, the complexes will not be produced. After first incubation, the micro well plate is washed to take away unbound materials. The enzyme-conjugated anti-human IgM antibodies are additional to micro well plate and then incubated. The enzyme-conjugated anti-human IgM antibodies will bind to immobilized antigen-MV IgM antibody complexes present. After the second incubation, the micro well plate is washed to take away unbound materials. Substrate A and substrate B are additional and then incubated to create a blue color indicating the amount of MV IgM antibodies here in the specimens. Sulfuric acid solution is added to the micro well plate to stop the reaction a color alter from blue to yellow. The color strength, which corresponds to the amount of MV IgM antibodies found in the specimens, is measured with a micro plate reader at 450/630 700 nm or 450 nm(17).

Results and Discussion

The evaluated of IgM antibodies to Measles viruses obtained in this study was 35(21.5%), prevalence of measles virus infection (28.2%) among aged (0–8) months , and (12.5%) among aged (9-23) months (Table 1).

Table.1 Measles infection among the different age groups of children

Age group (mounth)	Suspected		Measles positive
	Number	%	
(0-8) month	91	55.8	26 (28.2%)
(9-23) month	72	44.2	9 (12.5)
Total	163	100	35

In addition to, Table 2 shows the gender distribution of the prevalence of MV infection 5 (10%) among males and 30 (26.5%) among females.

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Table.2 Distribution of infected according to gender

Sex	Suspected		Measles positive
	Number	%	
Female	113	69.3%	30 (26.5)
Male	50	30.7%	5 (10%)
Total	163	100	35

prevalence of IgM antibodies to measles virus in children in relative to their vaccination 5(6.9%) among vaccinated children ,and 30(32%) among unvaccinated children Table3 .

Table.3 prevalence of IgM antibodies to measles virus among children in relative to their vaccination

Vaccination	Suspected		Measles positive
	Number	%	
Vaccinated	72	44.2%	5 (6.9 %)
Unvaccinated	91	55.8%	30 (32.9%)
Total	163	100	35

Table 4.show prevalence ofIgM anyibodies measles virus in Children of vaccinated and mothers with a past history of measles 12 (11.2%), and 23 (41%) among children of unvaccinated and mothers with no a past history of measles.

Table.4 prevalence of IgM antibodies measles virus among children in relative to their vaccinated mothers and measles a past history of mothers.

Children vaccinated & a past history of measles mothers	Suspected		Measles positive
	Number	%	
vaccinated mothers & a past history of measles mothers	56	34.4%	12 (11.2%)
unvaccinated mothers &non past history of measles mothers	107	65.6%	23 (41 %)
Total	163	100	35

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Table 5. The prevalence of Igm antibodies MV in children who were breast feeding 2(2.6%), and 33(37.9%) among non- breastfeeding children.

Table.5 prevalence of IgM antibodies to measles virus among children in relative to their breast feeding

Type of feeding	Suspected		Measles positive
	Number	%	
Breast feeding	76	53.4%	2 (2.6%)
Not Breast feeding	87	46.6%	33 (37.9%)
Total	163	100%	35

Measles leftovers a most important health problem worldwide, particularly in developing countries. It is dependable for an estimated 420,000 yearly deaths worldwide among children fewer than five years of age (14). While the number of reported cases has noticeably decreased in a lot of countries as the widespread utilize of the approved vaccine, outbreaks happen not only in unvaccinated subjects but too in extremely vaccinated populations (18). The foreword of the measles vaccine in the 1960s led to a considerable decrease in the occurrence rates of measles and its complications in developed countries. However, measles still to cause important morbidity even in areas where the vaccine is obtainable, typically because of imperfect exposure, which joint with the elevated infection of the virus, allows for its long-term spread, occasionally in outbreak proportions (11). This study was calculated to determine the prevalence of measles virus (MV) antibodies in children (0-23) months. This study was included 163 children under two year, In this study the occurrence of MV establish in children aged (0-8) months (28.2%) is higher than occurrence in previous studies (6.5%) reported for Kaduna State in Nigeria (19), and (7.0%) reported Akwa Ibom State (20), and (6%) reported in Maiduguri, Borno State (21). This early appearance of measles has been credited to declining maternal antibodies, particularly in the location where protection is from vaccination not normal infection (21). The frequency of (12.5%) was obtained in children aged (9-23) months, in this study is minor than frequency in previous studies (61.6%) (19, 22), and 30.2% reported in Akwa Ibom State (23) 32.2% among adult children in Giwa, (22), but agreement with 15.6%

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reported in another study as of Southwestern Nigeria (24). The cause for the practical differences may be accelerated measles manage actions, including better routine vaccination exposure, provision of a second dose of measles vaccine as part of additional immunization actions in certain countries of the world, and may be credited to the significance and perseverance of important establishment in ensuring improved measles vaccine exposure in their area (25). In this study, females were seen to be more vulnerable to measles infection than their male counterparts, this result is agreement with previous studies (19,23), and in Bolivia. (23,24,26), but disagrees with the work of Chechet *et al.* (4, 26) Measles prevalence was minor in children were vaccinated (6.9%) than in unvaccinated children (32%), this study agreement with more studies (19, 27, 6), (28,29,4,1). Measles frequency was low rank recorded for vaccinated children may reveal vaccine not a success as well as effectiveness of vaccination. Problems with storage, transportation, and preservation of a icy chain system can without difficulty influence the potency of vaccines in developing nations (27). The frequency of MV was elevated in children who were not breast feeding (37.9%) than in breastfeeding children (2.6%), this study is in agreement with previous studies (30,31), the low prevalence among breastfeeding children may be due to a elevated rank of antibodies, as well as some probiotics contained in breast milk that confer immunity in these children, transferred antibodies, human breast milk is consideration to play an essential role in safety of little infants from infections (32,33). Human milk is affluent in defensive proteins, counting secretary IgA (sIgA). The frequency of measles in children of unvaccination and mothers with non a past history of measles (41%) higher than children of vaccination and mothers with a past history of measles (11.2%), this agreement with previous studies by [AE Olaitan, et al.](#) (19,34,35). This low observed occurrence in children of vaccination and mothers with a past history of measles be able to explained through the information that these mothers have naturally acquired protection against measles, which provides passive defense to their infants (36). The attendance of IgM antibodies to MV in serum is analytic of innate measles disease or vaccination. However, in infants fewer than nine months of age, these antibodies usually reproduce placental antibodies transferred from the mother to the fetus (37).

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