© 2013,
Scienceline Publication
www.science-line.com

ISSN: 2322-4789
Asian Journal of Medical and Pharmaceutical Researches
Asian J. Med. Pharm. Res. 3(4): 176-178, 2013

AJMPR

Measles Antibody Followed MMR Vaccination among Children in BandarAbbass

Mohammad Bagher Rahmati[1], Fatemeh Safdarian[2], Tahmmineh Taherzadeh[2*], Abdollah Mousavi[3], Shahram Zare[4]

[1]*Department of Infectious Diseases, Children Clinical Research Development Center, Hormozgan University of Medical Sciences, Bandar Abbas, Iran*
[2]*Department of Pediatrics, Hormozgan University of Medical Sciences, Bandar Abbas, Iran*
[3]*Department of Pathology, Hormozgan University of Medical Sciences, Bandar Abbas, Iran*
[4]*Departments of Epidemiology and Biostatistics, Hormozgan University of Medical Sciences, Bandar Abbas, Iran*

** Corresponding author's Email: fmft2001@yahoo.com*

ABSTRACT: Measles is the most deadly of all childhood rash/fever illnesses. The disease spreads very easily, so it is important to be protected against infection. Extensive vaccination is the best way to prevent measles. We conducted a descriptive study conducted in 5 health service centers of Bandar Abbas and 194 vaccinated children from May 2012 to December 2012. Target groups were children with 13 to 18 months age who received first MMR vaccine (Group A) and 19 to 24 month's age children who received first and second MMR vaccine (Group B). We evaluated the anti-measles anti-body ELIZA method in both groups 1 to 6 months after vaccination. The results of this study showed that 1 to 6 month after first and second MMR vaccination, highly effective immunity against measles (98.96%) is acquired In 137 children (male, female) of group A, mean titer of anti-measles antibody was 57.69 IU/ml and in 58 children (male, female) in group B, was 55.70. Anti-measles antibody under 1.2 IU/ml considered as seronegative. Only two children in group A had insufficient immunity against measles. We found no significant difference between serum level of anti-measles antibody in two groups of children and also no remarkable correlation between gender and serum level of anti-measles anti-body found.

Key words: MMR Vaccine, Anti-Measles Antibody, Measles

ORIGINAL ARTICLE

INTRODUCTION

Measles is an acute viral infectious disease of childhood with high mortality and morbidity. This disease has the ability to spread rapidly and leave high number of cases and also has severe complications (Shamsizadeh, 2012). This highly contagious disease has several complications such as pneumonia, otitis media and encephalitis (Litman, 2010). Historically, Measles caused universal infection in childhood in the USA, with 90% of children acquiring the infection before 15 yr. of age. The Measles vaccine has changed the epidemiology of Measles dramatically. Once worldwide in distribution, endemic transmission of Measles has been interrupted in many countries where there is widespread vaccine coverage. Morbidity and mortality associated with Measles decreased prior to the introduction of the vaccine as a result of improvements in health care and nutrition (Wilbert, 2011). However, the incidence declined dramatically following the introduction of the Measles vaccine in 1963. The attack rate fell from 313/100,000 population in 1956-1960 to 1.3/100,000 in 1982-1988. In Iran, two doses of anti-measles vaccination applied form 1988(Poor Rodsari, 2000). Up to 2004, measles vaccination in ages of 9 and 15 months was a part of routine ammunition of children (Iran MohotIRo, 1999). After this year, all of children were vaccinated at 12 months and 4 to 6 years of age (Iran MohotIRo, 2005). In 2008, MMR vaccination schedule changed to 12 and 18 months of age (Iran MohotIRo, 2009). Although twofold vaccination with a measles containing vaccine (MCV) started in 1988 in Iran, and a considerably reduction occurred in the national wide incidences of measles, but reports show local endemic of measles. In 1998 National Institute for Prevention and Control of Diseases of Iran reported suspected and confirmed cases of measles were 13 and 8.2 in 100000 population of Zanjan province (Iran MohotIRo, 2009). MMR vaccine is a new vaccine in Iran and information about efficacy of that is low. A more direct and complementary assessment is necessary to evaluate vaccination activities and the level of community protection against measles. This descriptive study was designed to assess the anti-measles antibody 1 to 6 months after first and second times of MMR vaccination in Bandar Abbas, Iran.

MATERIALS AND METHODS

In this descriptive study conducted in Bandar Abbas, a total of 194 children were surveyed. Study participants were enrolled from September 2012 to February 2013 in five health and medical service centers. The study population comprised healthy male or female

To cite this paper: Rahmati M.B., Safdarian F., Taherzadeh T., Mousavi A., Zare SH.2013. Measles Antibody Followed MMR Vaccination Among Children in BandarAbbass. Asian J. Med. Pharm. Res., 3 (4): 176-178.

children aged 12 and 24months at the 1to 6monthsafter the first and second MMR vaccination. All of the subjects were selected by convenience sampling. Exclusion criteria included: previous measles, rubella, and mumps, story of reactions likely to be exacerbated by any component of the vaccine or allergic disease, chronic administration of immune suppressants drugs at the time during the study and history of maternal measles in pregnancy period. The study protocol was approved by Hormozgan medical science university ethic committee. After describing study procedure to parents, written consent was obtained and 3 mili liter blood taken from children to determine level of anti-measles antibody. Information such as; age, gender, date of vaccine administration, date of sampling, and amount of anti-measles antibody documented in a check list that designed by researcher. Collected samples evaluated in a unit laboratory. The measles IgG titer of all serum samples was determined by the ELIZA anti-measles IgG test and all samples were tested with the same lot number kits (Krouse measles kit). The result of the ELISA test was expressed quantitatively as an antibody concentration (mIU/ml) of optical density (OD). According to the cut-off values proposed by the manufacturer, Samples were categorized as seropositive or seronegative. Based on the manufacturer's instructions, categories for IgG antibody negativity (IgG titer<1.2) and seropositivity (IgG titer≥ 1.2) determined.

After collecting Sociodemographic and laboratory data, Analyses were performed using SPSS version 19 Complex Samples procedure. Calculations of the MMR seroprevalence and descriptive, univariate and multivariate analyses of measles specific antibody stratified by sociodemographic indices (age, gender and times of vaccination) included all children with known titers, regardless of the quality of their vaccination documentation. A p-value<0.05 was considered to be statistically significant.

RESULTS

The study population consist 194 children recruited from the outpatient care wards of five health centers. All children considered as two study groups (group A and B) with two different ranges of age. The breakdown of study subjects on the basis of age is shown in table 1. Significantly more boys than girls (124(63.8%) VS 71(36.2%) participated in the study. Subjects in group A, received first vaccine in 12 month of age and children in group B, completed their second dose of vaccine until 18 month. Group A contained 137 children (63.5% male and 36.5% female) (Table 1) with mean anti-measles antibody titer of 60.07 IU/ml. Mean anti-measles anti-body in boys were 49.97 IU/ml and in girls were 70.17 IU/ml, no significant difference found between boys and girls in this group (P>0.05). Fifty eight children recruited to group B, of them, 37 (63.8%) were boys and 21 (26.2) were girls. Mean anti-measles antibody titer in boys was 57.21 IU/ml and in girls was 53.02 IU/ml. We also found no statistical difference between immunization level in boys and girls in group B (p>0.05).

Overall, immunization against measles on the basis of gender was evaluated in both groups but there were no difference between boys and girls. According of national guidelines of Iran, MMR vaccination is performed in two doses in 12 and 18 months. In this study, mean titer of group an anti-measles anti-body was 57.26 IU/ml (SD=60.83) and in group B was 55.7. IU/ml (SD=62.64). Despite group B received two doses of vaccine, the mean anti-measles antibody between two groups was not significantly different (P>0.05).

Table 1. Result of demographic properties

Groups	Age range	Numbers	Male	Female
A	13-18 months	137	87	50
B	19-24 months	58	37	21

DISCUSSION

Measles is an infectious disease that can be preventable by vaccine administration. In most countries, measles vaccination of children has had considerable impact in control of measles disease. But various countries have reported measles epidemics despite high vaccine coverage. Example of these is measles epidemics of 1988–1990 in the United States, Canada, Taiwan, Hungary (Lee, 1992; Cutts, 1994). Also an epidemic reported by DaieParizi and colleagues in Iran in 1990. In this epidemic, Even though vaccine efficacy was estimated to be 88%, but just 29.1 % of cases had a history of appropriate immunization, indicating some problems with the cold chain, storage, improper vaccine handling, vaccine failure or inadequate immune responses. Previous investigations have demonstrated a strong correlation between the presence and titer of measles neutralizing antibodies and protective herd immunity (Redd, 1999). One of the critical factors in establishment of immunity against a given vaccine is the age at vaccination (Mazaher, 2003). In this study, we evaluated the serum levels of anti-measles antibody in 194 children. 136 of these children with mean age of 14.7 months, received the first MMR vaccine and 58 children with mean age of 21.3 months, received the first and second MMR vaccine. In this study, statistical analysis indicated no significant relation between immune status and grouped age at the first

vaccination versus second vaccination (P>0.05). Many studies compared the impact of one dose vaccination of MMR whit two doses. In a recent study, Guris (1998) founded measles attack rates were lower among those children whom 2-dose vaccination coverage were received Pebody (2002) reported that administration of two doses of MMR vaccine in children generate more humoral responses to measles vaccine and produce more anti-measles anti-body for longer time in comparison with one dose administration of MMR.

Another hypothesis in this study was the association between gender and the level of anti-measles antibody generation. Overlay 123(63.4%) boys and 71(36.6%) girls recruited to this study. Immunization level against measles compared between boys and girls. No significant correlation found between gender and immunization against measles (P>0.05). This result confirmed in other studies (Dahifar, 2006; EmamiNaeini, 2011). Dahifar (2006) evaluated anti-measles antibody in 339 children (206 girls and 133 boys) and gain the same results as our study. In conclusion, our study revealed a good response for measles after MMR vaccination. Iran is in the measles eradication phase, this high level of protection against measles is remarkable. In this study, evaluated population was limited due to lack of MMR vaccine in health service centers and the numbers of children who need to administer this vaccine. Beside of the results of this study, some studies report outbreaks of measles in some areas of the country (Shamsizadeh, 2012: Iran MohotIRo, 1999; Mazaher, 2003). Thus, further evaluations with more participants are necessary to ass's antibody response to measles after MMR vaccination in other parts of the country.

Acknowledgment: The authors of this article thank all the members of, Children Clinical Research Developments Center especially Mrs. Manghash and all the members of Doctor Mousavi Labrator.

REFERENCES

Cutts F.T. (1994). Successes and failures in measles control. J Infect Dis; 170(Suppl. 1): S32–41.

Dahifar H. (2006). Measles antibody in previously two doses immunized and reimmunized in school age children. Pediatrics journal; 15(2):151-157.

DaieParizi M. (1993). Measles epidemics in Kerman, Iran. Med J Islamic Republic Iran; 6(4): 249–254.

EmamiNaeini A.R. (2011).Measurement of Serum Antibody Titer against Measles in a group of Adults Receiving Measles-Rubella Mass Vaccination. Journal of Isfahan Medical School; 28(114): 584-589.

Guris D. (1998). Measles outbreak in Micronesia 1991-4: Ped. Inf. Dis. J; 17(1): 33-39.

Lee GC. (1992). Seroepidemiology and evaluation of passive surveillance during 1988–1989 measles outbreak in Taiwan. Int. J. Epidemiol; 21(6): 1165–1174.

Litman N. (2010). Douglas and Bennett's Principles and Practice of Infectious Diseases. Philadelphia: Elsevier Churchil Livingstone; 2201-2206.

Mazaher T. (2003). Seroprevalence of neutralizing antibodies to measles virus in a vaccinated population in Iran. European Journal of Epidemiology; 18: 1085–1089.

Pebody J. (2002). Immunogenicity of second dose measles-mumps-rubella (MMR) vaccine and implications for serosurveillance. Vaccine; 20 (7-8):1134-40.

Poor Rodsari H. (2000). Clinical condition of patients with suspicious and proven measles in Tehran. Tehran Journal of Medical Scinse; 60(2):7-13.

Redd S.C. (1999). Measles Vaccine. In: Plotkin and Orenstein's Vaccines, 3rd ed. Philadelphia: W.B. Saunders Company, 222–265.

Schedule and guideline of immunization. (Iran MohotIRo 1999) Tehran: Ministry of Health Publication.

Schedule and guideline of immunization. (Iran MohotIRo 2005) Tehran: Ministry of Health Publications.

Schedule and guideline of immunization. (Iran MohotIRo 2009) Tehran: Ministry of Health Publications.

Shamsizadeh A. (2012). Seroprevalence of measles, mumps and rubella antibodies in 18 months and 56 years old: Six months after measles-mumps-rubella (MMR) vaccination. Jundishpur J Microbiol; 5(4): 578-581.

Wilbert HM. (2011). Nelson textbook of pediatrics: Saunders Elsevier Philadelphia; 19th edition. Chapter 238 – Measles.