Fertile Women Are Still Under Risk For Having Congential Rubella Syndrome Infants In Denizli / Turkey

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Citation

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Abstract

Objective

This study was conducted to determine the seroprevalence of rubella antibodies among pregnant females in Denizli and to reemphasize the importance of vaccinating this population.
Method

Serum specimens of 232 women at first pregnancy were screened for rubella IgG antibody by Micro ELISA method.
Result

It was found that 192 (%82.8) women had rubella or were vaccinated prior to the research and 40 (%17.2) were sensitive to the disease.
Conclusion
We anticipate that rubella-related vaccination activities are included in national vaccination program.

INTRODUCTION

Rubella is a viral disease with minor morbidity and few complications unless it is contracted by a pregnant woman. Rubella infection is generally an asymptomatic childhood disease but during the first trimester of pregnancy often leads to fetal death or severe congenital defects (congenital rubella syndrome, CRS) ([1]).

While the inclusion of rubella vaccination into routine childhood immunization will decrease rubella virus circulation among young children, it will not have immediate impact on the transmission of rubella among adults or the occurrence of CRS.

It is possible to immunize women in fertile period with appropriate vaccination schedules ([1]). Worldwide, it is estimated that there are more than 100,000 infants born with congenital rubella syndrome (CRS) each year. In 1998, standard case definitions for surveillance of CRS and rubella were developed by the World Health Organization (WHO) ([2]).

Seronegative pregnant women should be immunized after delivery in order to prevent postnatal rubella infection and to prevent congenital rubella syndrome. If applied appropriately, vaccination against rubella protects the susceptible person in 95% of the cases. Enzyme Linked Immun Sorbent Assay (ELISA) is the most commonly preferred test against Rubella antibodies in immunized subject ([1],[3]).

The purpose of this study was to determine the seroprevalence of rubella antibodies among pregnant females during their first pregnancies and to reemphasize the importance of vaccination during reproductive periods.

MATERIALS AND METHODS

A cross-sectional clinic-based study was conducted among 232 pregnant women attending antenatal clinics from 2001 to 2002 in Denizli centrum in Turkey.

Women in their first pregnancies were selected. Data on the pregnant females and the socio-economic characteristics of the families were obtained using an interviewer-administered structured questionnaire.

After completing the questionnaire, the study groups were classified based on educational status, age, number of siblings, previous history of rubella infection, previous history of rubella vaccination, socio-economic status, and previous history of maculo-papular rash. Three milliliters of blood were obtained to measure rubella-specific IgG antibody levels via micro ELISA technique in Labotech (Biochem imunosystems) sytem. Results was analyzed with SPSS statistical program based on Fisher's exact chi-square test.

RESULTS

Of 232 pregnant women, 192 (82.8%) were found to be positive for rubella IgG. There was a gradual increase in the immunity status with decreasing age groups. Eighty-one percent (80.5%) of age group 15-19 years and 64.3% of age 30 years and over were positive for rubella IgG (Table 1). No difference was detected between those age groups statistically (P>0.05).

Figure 1

Table 1: Rubella IgG positivity by age group during pregnancy

Age	IgG(+) (No)	IgG(+) (%*)	IgG(-) (No)	IgG(-) (%*)	Total (No)	Total (%*)
15-19	33	80.5	8	19.5	41	100
20-24	104	83.2	21	16.8	125	100
25-29	46	88.5	6	11.5	52	100
30- +	9	64.3	5	35.7	14	100
Total	192	82.8	40	17.2	232	100

P>0.05

* = Row percentage

Females of high socioeconomic status showed higher incidence of immunity (87.5 %) compared to low socioeconomical class (80%). Difference was not detected between socioeconomically different groups (P>0.05).

Primary school graduates and high school graduates showed 81.1% and 89.7% positivity, respectively (P>0.05). Of 63 cases without history of previous rubella infection, 48 (76.2%) was found to be positive, and of 34 cases with previous rubella infection history, 31 (91.2%) were positive for rubella IgG (P>0.05). Sixty-four (64) of the 79 vaccinated cases (81.0%) and 15 of the 17 unvaccinated cases (88.2%) were found to be positive for rubella IgG respectively (P>0.05).

Eighty-three (83) cases had mentioned previous maculo-papular rash history but only 66 (79.5%) showed positive results. Fifty-seven (57) of 69 cases without previous maculopapular rash history (62.2%) were positive for the antibody (P>0.05). Seven percent (7%) of primary school graduate and 33.3% of high school graduate were found to have knowledge about the vaccination programs against rubella (P<0.001). But 5.7% of primary school graduates and 7.7% of high school graduates had only been vaccinated, respectively (P>0.05).

Of the 24 boarding student, 23 (95.8%) of the student, and of the 208 non-boarding students, 169 (82.8%) of the students, were positive against rubella (P>0.05). According to the number of siblings, 12 of 14 pregnancies having 0-1 siblings had (85.7%) positive results for rubella IgG, including 84 of 102 pregnancies having 2-3 siblings (82.4%), 96 of 116 pregnancies having 4 or more siblings (82.8%), respectively, (P>0.05).

DISCUSSION

Rubella is generally asymptomatic in healthy adults but leads to congenital rubella syndrome in fetus, so it is an important public health problem. The strategy for elimination of rubella and CRS depends on immunization of women during fertile period, study of surveillence of rubella and CRS, and control of the disease when there is an epidemic associated with infections ([4]).

In a previous study, we aimed to emphasize the importance of vaccination that is why we detected sero-negative pregnant cases. For this purpose, Rubella IgG antibodies were screened using ELISA method in our study group. The overall incidence of sero-positive cases was found to be 82.8%, including vaccinated and infected cases. But the 40 remaining pregnancies (17.2%) were sero-negative for the disease. The number of sero-negative cases were found to be low when compared to previous studies (Table 2).

Figure 2

Table 2. Rubella IgG seropositivity in Turkey from various studies

Author	Rubella IgG Female %	Date	Reference
İmre	90.1	1985	4
Ustaçelebi et al.	89.8	1986	5
Şengül et al..	86	1991	6
Taşçıoğlu	95.1	1991	7
Leblebicioğlu et al.	91.1	1992	8
Güner et al.	82.1	1994	9
İnan et al.	94.2	1994	10
Köksal et al.	66.8	1994	11
Başbuğ et al.	89.4	1994	12
Işık et al.	%86.3	1996	13
Ceylan	%94.5	1998	14
Akşit et al.	89.7	1999	15
Saçar et al.	82.8	2002	-

Rubella sero-positivity is not affected by age, the number of siblings or being a boarding student, unlike the findings from previous studies in Turkey ([7]). But crowded environments may be a risk factor for diseases such as rubella because of easy transmission. Since rubella is a childhood disease, the results may not be statistically different in other risk groups. Only 10.3% of the pregnancies included in this study were from boarding students.

It is a challenge to determine whether a case is as the result of infection or vaccination, simply from the history ([16]). The ideal solution is to search the fertile women for rubella and vaccinate the sero-negative cases. Thirty-one (31) of 34 (91.2%) cases who indicated that they had the disease were found to be positive. Eight ([8]) of 17 vaccinated cases indicated that they had such vaccines as MMR (measles, mumps and rubella). These cases were identified among groups from high socio-economic status, yet, they could not provide proper documentation of their vaccination history. Among the vaccinated and infected groups, no differences were observed in rubella IgG titres ($p>0.05$).

Ceylan mentioned that groups from high socio-economic status were more sero-negative than thoise from low socio-economic groups ($p<0.05$) ([14]). In the former study, socio-economic status did not effect the diseased state of the group ($p>0.05$).

Aksit et al. demonstrated that rubella IgG titers decrease with increasing age but were still protective against the disease. The relationship between sero-positivity and age group was not significant ([15]). In the former study, 80.5% of the 15-19 age groups and 64.3% of the 30 and older age groups were found to be positive against rubella ($p>0.05$).

Clinical outcome of the former study is important. Sero-negative women were still in their fertile period so the vaccination patterns were consistent. For rubella. Previous studies in Ankara and İzmir regions show different sero-prevalance patterns against rubella ([5,9,10,12,13,15,17]). More studies are needed to determine the sero-prevalance of rubella in our country.

Nearly 50% of CRS can be prevented via vaccination of the sensitive fertile women, based on the recommendations of the Advisory Committee on Immunization Practices (ACIP) ([18]). In our country, rubella vaccination is not a routine vaccine that is why people can only be vaccinated by reaching out to secondary or tertiary health centers or private health centers, or through public health education strategies.

In the findings from a U.S. study, the rate of rubella vaccination was not affected by the educational status of the study group ([19]). In the former study, 6.6% of primary school graduates and 33.3% of high school graduates had knowledge about vaccines for rubella ($p<0.05$), yet the vaccination coverage was not significant between those two groups.

After birth, rubella vaccination is advised. In England, 56% of CRS infants' mothers found to have multiple children were vaccinated to prevent CRS ([20]). But in a U.S.-based study, 65% of CRS cases occurred after the first delivery, so the need for post partum immunization to further prevent CRS ([16]).

Among Rubella IgG sero-negative cases, higher vaccination coverage is found in postpartum sensitive women ([16]). Sero-negative cases can be recommended for vaccination to decrease the risk of CRS.

In 1995-96, WHO conducted a review of rubella immunization strategies. Worldwide, 78 countries (more than one-third) reported a national policy of using rubella vaccine. This was closely related to the country's economic status. Based on the United Nations country classification, rubella vaccine is used in 92% of industrialized countries, 36% of those with economies-in-transition, and 28% of developing countries. Cases of CRS may be prevented as follows: by providing direct protection to women and/or

schoolgirls (a selective vaccination strategy); by vaccinating boys and girls to provide indirect protection by reducing the transmission of rubella virus (a childhood vaccination strategy); or by a combination of these approaches (a combined strategy) ([21]).

Obstetricians should always check rubella serologies in women of reproductive age even if they have been vaccinated. Rubella serology should also be checked in all pregnancies even if the patients were seropositives during their prior pregnancies ([22]).

In Turkey, the prevalence of CRS is not known .But the birthrate is very high, so the risk of CRS can be minimized by developing an appropriate vaccination strategy. In the former study, 40 of 232 pregnancies (17.2%) were found to be sero-negative against rubella. Sero-negative cases should be immediately vaccinated after delivery of the newborn in order to decrease CRS risks in future pregnancies. In Turkey, rubella vaccination is not routine. In previous studies, sero-positivity is due to infections. Generally, pediatricians suggest MMR vaccinations during childhood periods.

As a result the importance of rubella syndrome, rehabilitation of a CRS child is expensive and difficult, leading to physical, psychological and moral burden for the population, the family, the child, and the health care delivery system. Significant proportions of pregnant women were susceptible to rubella infection in this study population. A mass rubella vaccination program should be encouraged to prevent possible outbreaks of CRS. The present strategy of selective rubella vaccination should be reconsidered if we are to get closer to eliminating rubella syndrome in Denizli, Turkey.

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