Status of Rubella Immunity Among Pregnant Women in Southeast Region of Turkey

GÜNEYDOĞU ANADOLU BÖLGESİNDEKİ GEBELERDE RUBELLA İMMÜNİTESİNİN DURUMU

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Özet

Objective: To determine the status of Rubella immunity of pregnant women in the southeast region of Turkey

Material and Methods: A retrospective prenatal record review of 1239 women attending antenatal clinic was done. Rubella IgG level was determined by an automated enzyme linked immunoassay [ELISA (Axsym®, Abbott, Turkey)] and reported as immune, nonimmune, or uncertain.

Results: The mean age of patients was 29±5.6 (ranging from 17 to 42). Among the 1239 women included, 1092 (88.1%) were found immune, 132 (10.6%) were found nonimmune and 15 (1.2%) were found uncertain. Patients who were reported as non immune and uncertain were interpreted to be susceptible for infection and immunization after hospital discharge was recommended.

Conclusion: Recommendation for postpartum Rubella vaccination of nonimmune women should be adhered to in order to decrease the risk of congenital Rubella syndrome.

Key Words: Rubella, Seroprevalance, Pregnancy

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Summary

Amaç: Rutin antenatal gebelik takibine gelen kadınlarda Rubella enfeksiyonuna karşı bağışıklık durumunun belirlenmesi.

Gereç ve Yöntemler: Güneydoğu Anadolu bölgesinde yaşayan gebe kadınlarda Rubella enfeksiyonuna karşı bağışıklık durumunun belirlenmesi amacıyla restrospektif olarak rutin antenatal gebelik takibi için gelen 1239 kadın değerlendirildi. Rubella IgG serum seviyesi ELISA (Axsym®, Abbott, Turkey) yöntemiyle belirlendi. Hastalar IgG seviyesine göre enfeksiyona karşı duyarlı, bağışık ve belirsiz olarak rapor edildi.

Bulgular: Hastaların yaş ortalaması 29±5.6 (17-42 yaşlar arasında değişmekte)'dır. 1239 gebe kadının; 1092 (%88.1)'si bağışık, 132 (%10.6)'sı duyarlı ve 15 (%1.2)' i belirsiz olarak rapor edildi. Enfeksiyona karşı duyarlı ve belirsiz olarak rapor edilen hastaların hastaneden çıkışlarını takiben aşılanmaları önerildi.

Sonuç: Bu bilgiler ışığı altında, gebelerin postpartum dönemde aşılanmasının Konjenital Rubella Sendromu riskini azaltacağı kanısına varıldı.

AnahtarKelimeler: Rubella, Gebelik, Seroprevalans

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Rubella, also known as German measles, is a self limited mild viral illness that poses little danger to children or adults. Up to %60 of cases are subclinical. In clinically apparent cases; a 10-14 day incubation period is followed by 1-5 days of prodromal symptoms including low-grade fewer, mild flu-like symptoms and adenopathy. Characteristic maculopapular rash then appears on the face and chest and subsequent spreads to the extremities. Recovery is spontaneous and complete and immunity is typically lifelong. For the developing fetus however, infection with Rubella virus is a grave threat, capable of inducing severe anomalies and permanent disability. In the United States in the 1990s, an average of 25-40 infants per year were born with Congenital Rubella Syndrome (CRS) (1). There is no available drug that is effective for either maternal or fetal Rubella infection and administration of immune globulin has not been shown to prevent or modify the risk of CRS (2). Hence, vaccination of susceptible population before conception is the unique weapon available against the infection with Rubella which can occur during pregnancy. Major aim of

vaccination program is to reduce the incidence of CRS in the fetus and new born rather than reducing the incidence in children and adults. The key now is to eliminate CRS by identifying and vaccinating susceptible adults, particularly postpubertal women. Therefore, knowledge of age-specific Rubella immunity, especially the proportion of women of childbearing age who are susceptible to Rubella is a key element to implement an effective Rubella vaccination program.

The objective of this study was to investigate the status of Rubella immunity in the obstetrics population of southeast region of Turkey.

Material and Methods

The study was performed at Harran University, Faculty of Medicine, Obstetrics and Gynecology Department. A retrospective prenatal record review of 1239 patients who attended the antenatal care clinic from June 2000 to May 2003 was done. Rubella IgG antibodies were determined by an automated enzyme linked immunoassay system [ELISA (Axsym®, Abbott, Turkey, Coefficient variation of assay ranging from 5.5%to 14.7%)] and reported as immune, uncertain, or non immune. Women with a Rubella IgG titer more than 10 IU/ml were interpreted as immune, women with a Rubella IgG titer less than 5 IU/ml were interpreted as nonimmune and women with a Rubella IgG between 5-10 IU/ml were interpreted as uncertain. A bivariate analysis was performed to study the effect of parity and age on the immune status of the subjects.

Results

The mean age of patients was 29±5.6 (ranging from 17 to 42). The gestational age at the time of clinic visit ranged from 8 weeks to 34 weeks. Among the 1239 women included, 1092 (88.1%) were found immune, 132 (10.6%) were found nonimmune, and 15 (1.2%) were found uncertain (Table 1). Women whose Rubella Ig G titers were less than 10 IU/ml were interpreted as susceptible for infection and immunization of these patients were recommended after discharge of the hospital. They were also instructed not to become pregnant for 3 months. No statistically correlation was found neither between the age of patients and Rubella immunity (r=021, P>0.05) nor between parity and Rubella immunity (r=018, P>0.05). There was no history of vaccination against the Rubella infection among the immunized patients.

Table 1. Rubella immunity status according to age groups

	Age groups (years)			
	15-20	21-30	31-45	Total
Number of women	215	612	412	1239
Immune n (%)	185 (86)	545 (89)	362(87.8)	1092(88.1)
Uncertain n (%)	3(1.3)	7(1.1)	5(1.2)	15(1.2)
Nonimmune n (%)	27(12.5)	60(9.8)	45 (10.)	132 (10.6)

Table 2. Rubella immunity status according to parity

Parity	Immune n (%)	Nonimmune n (%)	Uncertain n (%)
<1	322 (88.4)	36(9.8)	6 (1.8)
1-4	413 (88.8)	50 (9.9)	2 (1.3)
>4	357(87)	46 (11.2)	7 (1.8)

Discussion

Rubella infection in the fetus or newborn can have devastating consequences. Infant in utero may remain asymptomatic for life conversely Rubella infection may cause the spectrum manifestations including congenital cataracts, senserineural deafness, congenital heart defect, microcephaly, mental retardation, and many others. The earlier in gestation the exposure to Rubella virus, the more likely and severe the fetal consequences will be. Summarizing data from several series Ghidini at al calculated that maternal infection at 4-6 weeks of gestation results in CRS in 100% individuals; at 7-12 weeks in 80%; at 13-16 weeks, in 45-50% at 17-20 weeks in 6%. There were no cases of CRS when maternal disease occurred after 20 weeks gestation (3).

It is not so easy for both parents and physicians to decide between continuation and termina-

tion of pregnancy when they encounter Rubella infection during pregnancy; not only because of absence of gold standard, non-invasive diagnostic test, but also unavailability of effective drug for either maternal or fetal infection. Prenatal diagnosis of CRS is presumptive, expressed as probability of involvement based on maternal serology and calculation of gestational age at the onset of maternal viremia. Prenatal ultrasound can detect abnormalities compatible with CRS but is not perfectly sensitive (4). As the fetus is incapable of producing detectable amount of IgM before the 20-22th gestational weeks, it is not possible to detect fetal antibodies in umbilical cord blood samples before this time (5).

Virus can be identified in amniotic fluid and chorionic villi earlier in pregnancy but these techniques are technically difficult and time-consuming (6). Although detection of viral RNA using reverse transcription polymerase reaction techniques is a promising tool because it offers rapidly available result with similar sensitivity as viral isolation. It is now not so cost effective (7). Again, while counseling patients after prenatal testing, care must be taken basing decisions on test results.

Detection of fetal IgM or Rubella RNA is not in itself diagnostic of CRS. Not all fetuses in whom IgM or Rubella RNA is detected are infected. In turn, not all infected fetus will develop CRS (7).

In the light of these data we consider that vaccination against Rubella infection remains unique choice for the prevention of grave consequence of Rubella infection. A review of Rubella immunization strategies used worldwide was conducted in 1995-1996. According to this report it was concluded that significant outbreaks of Rubella have been reported among older adolescent and young adults after widespread vaccination of children which might alone pose a risk of an increase in CRS (8). Therefore it is essential to include the vaccination of women of childbearing age in any Rubella control strategy. However it should be kept in mind that protective effect of vaccination could not be 100% even every individual of population are vaccinated for Rubella infection in their childhood period.

A study performed in Australia shows that the incidence of CRS has fallen dramatically since the introduction of school girl vaccination programmes. According to the results of this study they have recommended continuous surveillance of Rubella case, high coverage in the vaccination programme and until circulation of Rubella is stopped, prepregnancy testing with special emphasis of women 25 years and above (9). An official Rubella immunization program has not yet been adopted in Turkey because of fact that Rubella immunization of infant can interrupt the circulation of the virus in the community, hence Rubella infection may shift to childbearing years and lead to more common CRS. However the vaccine is distributed widely in the private sector, and many child physicians continue to propose combined Measles-Mumps-Rubella (MMR) vaccine to children 12-15 months of age. In contrast, immunization of prepubertal girls and postpubertal women against Rubella are usually neglected.

The grave consequences of Rubella infection during pregnancy makes it highly desirable to document immune status at preconception period particularly in immunized women and especially in those above the age of 25 year since an assessment of immune status based on the history of infection or immunization is not reliable. However, In Turkey, seroepidemiology of Rubella infection in women of childbearing age has been addressed in a limited number of studies. Two studies performed in Ankara have reported Rubella seropositivity rates of 98 and 82%, in pregnant women (10,11) and other study carried out in İzmir has reported that overall Rubella seropositivity rate of 89.7% (12). In the present study we have found Rubella seropositivity rate of 88.1%.

In the light of above, we believe that nationwide seroepidemiological surveys to determine age-specific Rubella immunity is essential. Approximately 10-15 % of women in reproductive age are still susceptible to infection with Rubella during pregnancy therefore antibody screening should be continued and obstetrician-gynecologist should not miss the opportunity to screen, and immunize if appropriate young women under their

care. They have unique opportunities to deliver vaccines to women of all ages. In addition to repeated contact with pregnant women, many obstetrician-gynecologists serve as primary care providers for non-pregnant women who do not otherwise have a regular point of contact with the healthy care system. Following the termination or completion of their pregnancy, susceptible women should be vaccinated before discharge from the hospital. We also think that, since extramarital pregnancy is extremely rare in our country, screening can be made at the time of marriage and selective vaccination for those who are not immune should be carried out provided that avoidance of conception within 3 month of vaccination.

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