

# Seroprevalence of Rubella in Pregnant Women at the Military Hospital Oued Eddahab Agadir, Morocco

Souhail Mouline<sup>1,2,3\*</sup><sup>1</sup>Medical Biology Department, Military Hospital Oued Eddahab, Agadir<sup>2</sup>Faculty of Medicine and Pharmacy, Marrakech<sup>3</sup>Cadi Ayyad University, MarrakechDOI: [10.36347/sasjm.2024.v10i02.005](https://doi.org/10.36347/sasjm.2024.v10i02.005)

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\*Corresponding author: Souhail Mouline

Medical Biology Department, Military Hospital Oued Eddahab Agadir, Morocco

## Abstract

## Original Research Article

Rubella is an epidemic rash that is generally benign, but dangerous for pregnant women in the early stages of pregnancy, due to the teratogenic power of the virus. It causes spontaneous abortion, fetal death, premature delivery and congenital malformations known as congenital rubella syndrome (CRS). The aim of this study was to determine the rubella immune status in all pregnant women consulting or being tested at the Medical Biology Department of the Oued Eddahab Military Hospital in Agadir. An 18-month retrospective cross-sectional study was conducted from January 1, 2022 to June 30, 2023 to assess the IgG seroprevalence of rubella in 1393 pregnant women aged 19 to 43 years old of any gestational age using the Architect i1000SR Analyzer. Of the 1393 pregnant women tested, 1184 (85%) were seropositive. Despite of the vaccination recommendations after their anterior pregnancy, 07% of multiparous remained seronegative. Preventive measures against congenital rubella must be reinforced and vaccination awareness campaigns, particularly for unimmunized multiparous women, remain essential.

**Keywords:** Congenital rubella syndrome (CRS), pregnancy, congenital malformations.

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## INTRODUCTION

Rubella is a benign viral infection generally occurring in childhood. However, it can be responsible for fetal death or congenital malformations when maternal primary infection occurs during the first 20 weeks of pregnancy. The most frequent anomalies linked to congenital rubella are auditory (deafness, hypoacusis), ophthalmic (cataract, microphthalmia, retinopathy) neurological (encephalitis, microcephalus) and cardiac (patent ductus arteriosus, pulmonary artery hypoplasia) [1]. Vaccination against rubella remain with the early natural infection the ways to prevent congenital rubella [2]. In Morocco, the vaccination program does not include women of childbearing age. Reducing the incidence of the disease and the number of cases of Congenital Rubella Syndrome would only be possible if circulation of the virus was interrupted by mass vaccination of women of childbearing age, school-age girls, and by systematic vaccination of children with the combined Measles Rubella or Measles Mumps Rubella vaccine. The epidemiology of rubella remains poorly known in Morocco, due to the fact that it is not mandatory reporting [3]. Recently, some Nationwide studies (Rabat, Meknes, and Marrakech) have focused on

the seroprevalence of IgG antibodies in pregnant women. A susceptibility of 9.8%, 11.3%, and 15.3% respectively has been reported [4-6]. The aim of this study is to determine the immune status against rubella of pregnant women who carry out their blood test in the Military Hospital Oued Eddahab Agadir, taking into account the sociodemographic context, and to attempt to establish a link between seroprevalence and factors studied.

## PATIENTS AND METHODS

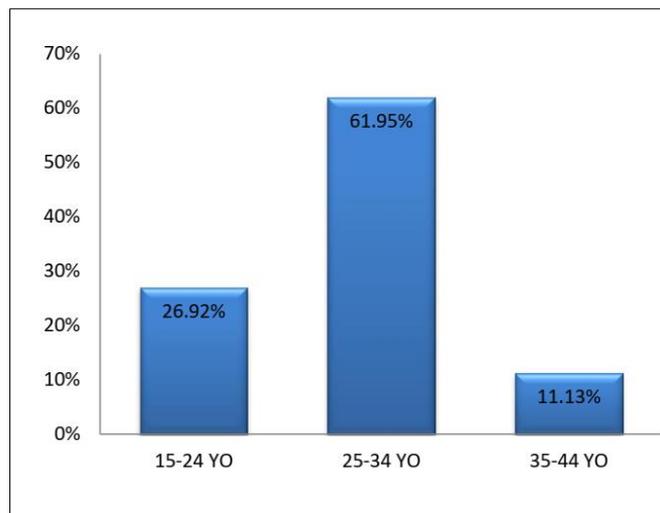
This is a retrospective cross-sectional study carried out within the Medical Biology Department of the Military Hospital Oued Eddahab Agadir Morocco between January 1, 2022 and June 30, 2023. Were included all pregnant women from whom the samples were taken in our structure during this period. Participation was voluntary. Before their enlistment, the subjects were well informed about the objectives of the study and a Oral consent was received from each participant. The levels of anti-rubella immunoglobulin G (IgG) were measured in serum samples and carried out with the ARCHITECT i1000SR immunoassay analyzer by chemiluminescence technique. A result is considered Positive if the IgG level  $\geq 10.0$  IU/ml, Negative: if

between 0.0 and 4.9 IU/ml, and Doubtful: if between 5.0 and 9.9 IU/ml. In our study, doubtful values were considered negative. Statistical analysis was carried out using SPSS version 21 software. The study of the association between rubella seroimmunization and sociodemographic characteristics is evaluated by the  $\chi^2$  test and the Fisher exact test for qualitative variables. The p value <0.05 (which represents the level of significance) is considered statistically significant.

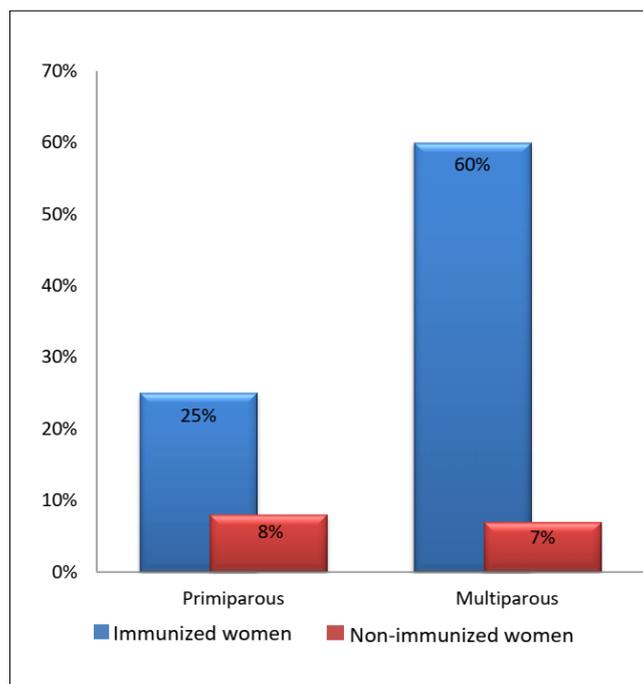
**RESULTS**

1393 serum samples were processed at the Medical Biology Department for the determination of anti-rubella IgG levels during the study period. Among the 1393 pregnant women sampled, 1184 (85%) had IgG.

The mean age of the patients was 25.4 years, ranging from 19 to 43. The age group between 25 to 34 was the most represented, with 62% (863) of cases (figure1). Of the total of 1393 women, 820 were in first, 441 were in second, and 132 in third trimester of pregnancy. 33% (460) of women who have undergone serology of rubella are primiparous, while 67% (933) were in their second pregnancy or more (figure 2). 5.16 % (72) of patients had a history of miscarriage or fetal death in utero. 78% (1086) of women were of urban origin with an average socio-economic and educational level. We note that 7% of multiparous women remain seronegative for rubella in their later pregnancies. No statistically significant relationship between rubella immunity and all the factors cited was observed.



**Figure 1: Distribution of patients by range age**



**Figure 2: Immune status of pregnant women by parity**

**Table 1: Seroprevalence of rubella in national and international studies**

<b>Our study</b>	<b>85%</b>
Rabat [4]	90.2%
Meknes [5]	88.7%
Marrakech [6]	87.77%
Ouarzazate [7]	85%
Tiznit [8]	83.4%
China [9]	83.3%
India [10]	83.4%
Gabon [11]	87.56%
Italy [12]	88%
Kuwait [13]	88.4%
Mexico [14]	97.1%
Tunisia [15]	79.7%

## DISCUSSION

Rubella is usually a mild illness that passes often unnoticed. Its importance from a public health point of view is due to its teratogenic effects, when it occurs in a woman pregnant during the first 20 weeks of pregnancy. The most serious damage mainly affects the eye, ear, the cardiovascular system and the central nervous system [2]. Although progress is regularly made, the diagnosis of maternal infection is not always easy. Seroprevalence surveys are of great interest for measuring the prevalence of rubella infection, mainly among pregnant women.

Recently, several studies carried out in Morocco: Rabat [4], Meknes [5], Marrakech [6], Ouarzazate [7], and Tiznit [8], found a seroprevalence ranging from 82% to 90.2%. These studies provide us with information on the situation of pregnant women with regard to rubella in some regions of Morocco. In our study, 85% of women were immunized against rubella.

This rate is comparable to the rates reported on national level. Our result is also in agreement with the results reported in certain international studies such as those of China [9], India [10], Gabon [11], Italy [12], Kuwait [13] which are respectively 83.3%, 83.4%, 87.56%, 88%, and 88.4%. However, it is slightly reduced compared to that reported in Mexico 97.1% [15], and higher than that reported in Tunisia 79.7% [16] (Table 1). Comparison of seroprevalence rates between studies is difficult due to different factors: sampling, the time taken to carry out the study in relation to epidemic periods, the variability of laboratory procedures and the threshold value of IgG positivity [4, 5]. Data from certain countries show that seroprevalence seems to increase with age and educational level [8]. Whereas in our study there is no significant relationship between immunity to rubella and the factors studied. This may reflect the lack of information on rubella which makes companions necessary health education and screening among women of childbearing age. The difference in rubella immune status in different countries may be related to the health and socioeconomic conditions of each country. In our study, 7% of multiparous women remained seronegative

for rubella in their subsequent pregnancies even though they should be vaccinated after the first delivery. The World Health Organization (WHO) recommends that any pregnant woman who does not have anti-rubella IgG or woman with unknown immune status should be vaccinated postpartum before leaving the hospital [4, 5]. This lack of vaccination of these seronegative women postpartum can be explained by the lack of communication between patients and health personnel on the indispensability of this vaccination after delivery.

## CONCLUSION

Rubella is a viral disease, epidemic, contagious and immunizing essentially in children and usually benign in its clinical manifestations, but serious in pregnant women during the first months of pregnancy due to the frequency of congenital malformations that it causes. Rubella serology performed during pregnancy is difficult to interpret, and all women of childbearing age must be serodiagnosed for rubella before pregnancy. Our study revealed that 85% of pregnant women had anti-rubella IgG antibodies. It remains insufficient in relation to the objectives of fighting this infection. Thus, information campaigns must be organized in hospitals, schools, dispensaries, on the risk of malformative congenital rubella to encourage women of childbearing age to catch up with vaccinations.

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