

# RUBELLA VACCINE – AWARENESS ALONE CANNOT INFLUENCE THE ATTITUDE OF PEOPLE: A CROSS-SECTIONAL SURVEY AMONG MEDICAL STUDENTS AND PROFESSIONALS IN CENTRAL INDIA

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## ABSTRACT

**Background:** About a third of the world's countries still lack rubella vaccination programs, so the virus remains common in many developing nations including India.

**Aims & Objective:** The present cross-sectional study was carried out to study awareness, vaccination coverage, reasons for not receiving vaccine and the outlook of unvaccinated subjects for future vaccination against rubella.

**Material and Methods:** It was conducted among 202 women medical professionals from a tertiary care and teaching hospital of Ujjain district in central India.

**Results:** The study revealed that though the awareness about rubella was high (94.1%) vaccination coverage was only 42.1%. The commonest reasons quoted for non-vaccination were related to their non-seriousness about the issue. Sources of information for rubella vaccination were their gynaecologist/doctor (62.3%) or medical books or literature (36.5%) and not any mass media.

**Conclusion:** The study delineates the difference in the knowledge of rubella and vaccination status in medical professionals. The study shows that the awareness alone cannot influence the attitude of the people but better strategies are needed for that.

**KEY-WORDS:** Rubella Vaccine; Medical Students; Medical Professionals; Awareness; Vaccination Status

## Introduction

Rubella is generally a mild illness but when contracted by pregnant women, especially in the first 16 weeks of pregnancy, it frequently causes serious complications including miscarriage, abortion, stillbirth, and congenital rubella syndrome (CRS).<sup>[1,2]</sup> WHO estimates that there are 110,000 cases of CRS worldwide every year. There is high incidence of infection reported among the preschool children (6 months - 5 yr age group) with 51-69.2 per cent seropositivity. These children can transmit the virus to susceptible pregnant women thereby increasing the risk of CRS.<sup>[3,4]</sup> Sero-epidemiological studies in India have shown susceptibility of 20-46 per cent in women of child bearing age<sup>[5]</sup>, hence it is necessary to prevent the infection among women of child bearing age. The best way to prevent rubella and CRS is vaccination, which has been applied all over the world.<sup>[6,7]</sup> For vaccination, the RA 27/3 strain

is most widely used and is administered subcutaneously.<sup>[8]</sup> A single dose of rubella vaccine will result in immunity that persist for at least 18 years in more than 90% of the vaccine recipients.<sup>[9]</sup>

Two strategies to prevent CRS are available. One is based on screening for the immunization status of women of child-bearing age, and immunizing only susceptible ones. The other relies on universal vaccination of adolescents and young women. Problem in first case is its effectiveness in clinical settings which is limited by incomplete screening, imperfect screening tests and failure to vaccinate susceptible. While the second case where the routine vaccination of all women of child-bearing age is recommended without screening, avoids the problem of noncompliance with return visits, but results in vaccination of many women who are already immune.<sup>[10]</sup> Because the adverse effects of vaccinating immune individuals appears to be

minimal, cost and convenience are likely to be the determining factors in deciding which strategy should be used. About a third of the world's countries still lack rubella vaccination programs including India.<sup>[11]</sup>

Considering the severity of CRS and availability of affordable, acceptable, safe and effective vaccine to prevent it, most of the European countries like Denmark, Sweden and United States have included two doses of rubella in their immunization schedule. In these countries first dose of Measles, Mumps and Rubella (MMR) vaccine is given at 15-18 months of age followed by second dose at 12-14 years of age as MMR vaccine or rubella vaccine exclusively for girls. WHO recommended introduction of rubella-containing vaccines in immunization program of countries that have not yet introduced it.<sup>[12]</sup> This can be achieved by booster dose of vaccination at school age or adolescence.

Occupational exposure to rubella infection among health care workers deserves special attention. The health care workers who are not immune to rubella are at risk of contracting it especially from their patients.<sup>[11,13]</sup> This is particularly important in countries that don't include rubella vaccine in their national immunization program.<sup>[13]</sup> Infected health care workers can also act as a potential source in the transmission of the virus.<sup>[14]</sup> Therefore this study was planned to estimate rubella vaccine coverage among the women medical students and professionals of child bearing age and its association with their knowledge, awareness, reasons for not receiving vaccine and the outlook of unvaccinated subjects for future vaccination against rubella. The study included women medical students and professionals of child bearing age who were enrolled in tertiary care and teaching hospital of Ujjain district in central India for their studies or profession.

The objectives with which the study was undertaken are: (i) to study knowledge and awareness of potential danger of rubella contracted during pregnancy in women medical students and professionals of childbearing age; (ii) to study the source of information for the knowledge and awareness about rubella vaccine

among study participants; (iii) to study the rubella vaccine coverage among study participants; (iv) to study the reasons for not receiving vaccine in the study participants; and (v) to study the outlook of unvaccinated participants for future vaccination against rubella.

## Materials and Methods

### Study Design

The present study was designed as a cross-sectional study conducted among medical students and professionals at a tertiary care and teaching hospital of Ujjain district in central India. The data collection for the study was conducted in the month of November 2011. The study included medical professional women of reproductive age group (i.e.15-40years)<sup>[14]</sup> studying or working at this institute. The minimum age group of participant in this study was 18 years and maximum was 40 years.

### Definitions

- Participants: Medical students of 2<sup>nd</sup>, 3<sup>rd</sup>, final year MBBS (Bachelor of Medicine and Bachelor of Surgery), interns, postgraduates and faculty working in above mentioned institute and consented to participate in the study.
- Awareness: A woman was considered to be aware if she had a correct knowledge about the risk of rubella disease and damage to fetus by rubella contracted during pregnancy, about vaccine availability and purpose of vaccination against rubella.
- Vaccinated: Vaccination status was determined using the proportion of women who reported a history of vaccination at pre-school age or school age or adolescence or later in adulthood when they were planning their family.<sup>[15]</sup>
- Attitude: Attitude of participants was assessed by their felt need for rubella vaccine. It was assessed by knowing the outlook of unvaccinated participants for future vaccination against rubella.

### Data Collection

The participants were identified through the official rolls and enlisted for inclusion in the study and were interviewed using a structured

questionnaire. The proforma included questions regarding relevant demographics and knowledge about risk of rubella in pregnancy. Any prior history of the disease, vaccination received and if not, the future outlook to take vaccine against rubella was also recorded.

**Analysis**

Data entry and analysis was carried out using SPSS (version 16). The awareness level and vaccination status were plotted against the years of their academic level. Chi-square test was used wherever necessary and p-value <0.05 was considered statistically significant.

**Ethical Considerations**

Study received approval from the Independent Ethical Committee of R.D Gardi medical college and institute. The study did not involve any interventional or invasive procedures. The subjects were explained the design and purpose of the study. They were assured about their confidentiality. They were asked for their informed consent to participate in the study. Their participation was completely voluntary and they were informed about their right to opt out of the study any time without giving any reason.

**Results**

A total of 202 eligible subjects were identified, enlisted and asked for their informed consent to participate in the study. All of them agreed to participate in this study. Maximum study respondents were in the age group 21-25 (55.5%) with 25.3 as the mean age (SD = 3.53). The demographics of these study subjects are shown in Table-1.

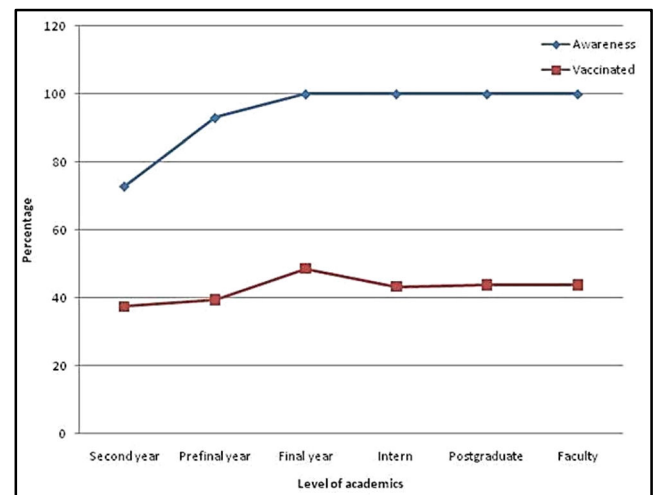
**The General Awareness of Study Respondents about Rubella and Its Vaccine**

As during the study it was found that awareness among the medical professionals regarding the rubella disease was 100%, while 94.1% (n=190 out of 202) of medical professionals were aware of rubella vaccine and 92.1% (n=186 out of 202) were aware about the fact of damage to fetus by rubella contracted during pregnancy. We found that 92.1% of participants knew the main purpose

of rubella vaccination for women of childbearing age was to prevent CRS. It was observed that when participants were interviewed, frequency of positive responses were higher in participants of final year, interns, postgraduates and faculty then the participants of second and pre-final year ( $X^2=33.7$ ,  $df=5$ ,  $P\text{ value}=0.000$ ). (Fig-1)

**Table-1: Socio-demographic Profile of Study Participants (N = 202)**

Characteristics		N (%)
Age (Years)	18-20	14 (6.9)
	21-25	113 (55.9)
	26-30	62 (30.7)
	31-35	7 (3.5)
	36-40	6 (3)
Qualification	Second year	48 (23.8)
	Third year	43 (21.3)
	Final year	33 (16.3)
	Interns	30 (14.9)
	Postgraduate	32 (15.8)
	Faculty	16 (7.9)
Marital Status	Married	40 (19.8)
	Not married	162 (80.2)



**Figure-1: Knowledge and Awareness about Rubella Vaccine and Vaccination Status of Study Respondents**

**Vaccination Status of Study Respondents and Related Facts**

**Table-2: Distribution according to Period when vaccinated and Outlook of Unvaccinated Study Participants for Future Vaccination against Rubella**

Characteristics		N (%)
Vaccinated (n = 85)	At School level	59 (69.4)
	At College level	19 (22.4)
	Before pregnancy	7 (8.2)
Not Vaccinated (n = 117)	Planning for vaccination	86 (73.5)
	Not Planning	31 (26.5)

In spite of such awareness, only 42.07% (n=85 out of 202) reported to be vaccinated against rubella. 117 (57.9%) out of 202 denied of any history of rubella vaccination or were not sure about it.

Among these 73.5% (n=86 out of 117) are planning to take the vaccine. (Table-2)

As reported by the vaccinated subjects the most important sources of information on vaccination against rubella included gynaecologist/doctor (62.3%, n=53 out of 85) followed by medical books and medical literature (36.5%, n=31 out of 85). When asked to list communication media likely to call their attention to the need for vaccination against rubella, nobody agreed to the fact that media and television was their source of information for taking the rubella vaccine.

When asked about the reasons for not getting vaccines 44.4% (n=52 out of 117) study respondents mentioned non seriousness about the issue as the reason whereas 23.1% (n=27 out of 117) mentioned that they didn't get time out of their busy schedule, 14.5% (n=17 out of 117) mentioned lack of enough motivation to take vaccine, 11.9% (n=14 out of 117) had no information was available, while 5.9% (n=7 out of 117) had completed their childbearing.

### Association between Level of Awareness, Vaccination Status, Year of Academics and Marital Status

Table-3: Vaccination Status as per Socio-Demographic Correlates

Characteristics		Vaccinated (n=85)	Not Vaccinated (n=117)	P value
Age (Years)	15-20	7 (8.20)	7 (6.00)	0.73
	21-25	46 (54.11)	67 (57.30)	
	26-30	25 (29.41)	37 (31.60)	
	31-35	3 (3.50)	4 (3.40)	
	36-40	4 (4.70)	2 (1.70)	
Qualification	Second year	18 (21.2)	30 (25.70)	0.95
	Third year	17 (20.00)	26 (22.20)	
	Final year	16 (18.80)	17 (14.50)	
	Interns	13 (15.30)	17 (14.50)	
	Postgraduate	14 (16.5)	18 (15.40)	
	Faculty	7 (8.20)	9 (7.70)	
Marital Status	Married	62 (72.90)	100 (85.50)	0.03*
	Not married	23 (27.10)	17 (14.50)	

\* P value < 0.05 (significant)

There was no significant association between awareness regarding rubella and its vaccine and vaccination status of study participants ( $\chi^2 = 0.02$ , df = 1, P value = 0.888). Figure-1 shows the awareness level and vaccination status which is plotted against the years of their academic level. No significant association was found between the

year of academics and getting rubella vaccine ( $\chi^2 = 1.157$ , df = 5, P value = 0.949) though, their lies a significant association between being married and getting rubella vaccine ( $\chi^2 = 4.866$ , df = 1, P value = 0.027) (Table-3). This clearly indicates that there are more married females who were vaccinated.

### Discussion

Level of awareness regarding the disease and vaccine was high (92.1%) among the study subjects and it was increasing significantly with their years of academics ( $\chi^2 = 33.7$ , df = 5, P value = 0.000). This was expected as per the fact that they are taught about it in their regular course books and because of their regular interaction with the gynaecologist/doctors. But this good awareness did not reflect into good vaccination coverage which was just 42.07% among these subjects. Non seriousness about the issue was the most common reason given by 44.4% study respondents who were not vaccinated, 23.1% didn't get time to take vaccine out of their busy schedule. Lack of enough motivation to take vaccine was reported by 14.5% and whereas only 11.9% reported lack of awareness as the reason for non-vaccination. However, 5.9% study participants have already completed their family and thus quoted it as reason for not getting vaccine. Almost three quarters of these women were planning to take rubella vaccine but not received one yet. This warrants special attention and more emphases should be laid on putting this knowledge into practice. This is a sensitizing exercise for health care providers and hypothesizes the notion that awareness alone cannot influence the attitude of the people.

Rubella vaccination is of greater concern in medical professionals as they (if not immune) are at risk of contracting it especially from their patients and can also act as a potential vector in the transmission of the virus.<sup>[14]</sup> Secondly as medical professionals are set examples for general population, greater engagement of health professionals and media is important to enhance the general population awareness. As per our review, awareness regarding routine immunization is low in general population of India.<sup>[16]</sup> No data is available about awareness of rubella vaccine in general population of India and



this necessitates recommendation for further research in this area. Indians need to collect reliable and accurate data to prioritize and tackle the serious consequences of CRS.

To reach the maximum number of Indian families, all three major media channels- TV, radio and newspaper played a significant important role in creating awareness for OPV and in reaching the final goal of polio eradication.<sup>[17]</sup> Nobody among study participants who were vaccinated, agreed that media was their source of information for taking rubella vaccine. The major source of information about the rubella vaccine in the study subjects was the gynaecologist/doctors. This may be because of their regular interaction with the resources. Many of these medico subjects have doctors in their family and friend circle. Interaction with gynaecologist/doctors is highest after pre-final year of academics when plateau was observed in their level of awareness about rubella and its vaccine. (Figure-1) Another important source was medical books and medical literature. This indicates that doctors and medical books were the major source of awareness for these study subjects which may not be so for general population.

The results of this study emphasize on the need for comprehensive measures for intervention strategies to prevent CRS in India, particularly when the available evidence shows that, there still remains a significant risk of congenital rubella due to high levels of susceptibility.<sup>[14]</sup> Though the endemicity of rubella is established in India, exact disease load in the community cannot be made because the cases are subclinical or clinically mild, majority remain undiagnosed.<sup>[15]</sup> Consequently, no distinct policy has been envisaged for assessing the burden of rubella and no policy for control measures against rubella are in place. Considerations should be made on the necessity for rubella vaccination program to all female adolescents and women of childbearing age unless they have either laboratory evidence of detectable antibody or documented evidence of having received vaccine.<sup>[15]</sup> Presently MMR vaccine has been a part of immunization schedule in the developed countries; it is yet to be included in the national immunization schedule of India.<sup>[18]</sup> The Indian Academy of Paediatrics (IAP) recommends

measles vaccine at 9 months of age. They also recommend to offer MMR vaccine to all those who can afford it as two dose schedule, one at 15-18 months and second at school entry (4-6 yr of age).<sup>[19]</sup> Therefore in absence of any standard recommendations, MMR is being administered randomly in preschool children only.<sup>[18]</sup> WHO recommends that countries take the opportunity of accelerated measles control and elimination activities to introduce rubella-containing vaccines.<sup>[12]</sup> All countries that have not yet introduced rubella vaccine, and are providing two doses of measles vaccine using routine immunization and/or supplementary immunization activities should consider the inclusion of rubella vaccine in their immunization programme.<sup>[20]</sup> In India, to fulfill the need for a second dose of measles vaccine, IAP recommends a dose of MMR at 15-18 months of age.<sup>[21]</sup> The Delhi Government has adopted this recommendation for children in Delhi.<sup>[20]</sup>

### Limitations

The study has been conducted on medical professionals which reduces the generalizability of the result. Vaccination status was determined using the proportion of women who reported a history of vaccination any time in their life time which can result in recall bias.

### Conclusion

The study shows that though there was quite high awareness about rubella disease and its vaccine among medical professionals, the vaccine coverage among them was considerably low. The participant's awareness increased significantly with increase in years of academics but it did not reflect into corresponding increase in vaccination coverage. The key sources for this awareness were doctors and medical books/literature and not any media. Majority of respondents mentioned non-seriousness about the issue as the reason for non-vaccination against rubella. The study shows that the awareness alone cannot influence the attitude of the people. Better strategies and reinforcement are needed to improve coverage of vaccines like rubella which are not included in universal coverage programs.

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