Assessment of knowledge and awareness regarding rubella infection among medical professionals seen in IGIMS, Bihar

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ABSTRACT

Introduction: In developing countries like India, the comprehension of rubella virus illness, its consequences, and vaccine are nominal. Rubella virus infection occurring during pregnancy could lead to congenital rubella syndrome (CRS). Aim: The study aimed to know the awareness among young women healthcare practitioners of the reproductive age group towards rubella virus illness, its impacts, and vaccination. Method: The research had been carried out on 200 medical practitioner women of reproductive age category between 18 and 40 years. A restructured questionnaire-based interview has been conducted to check their comprehension about it. Result: Nearly all women of reproductive age did not know about the occurrence of rubella virus disease, its consequences, and vaccination. Conclusion: The research shows the absence of knowledge of rubella virus disease and demands for awareness programs to advertise properly in Bihar.

Keywords: Awareness, congenital rubella syndrome, medical professionals, rubella vaccine, rubella virus infection

Introduction

Rubella, also called German measles, is a communicable viral illness that typically begins with mild fever and lymphadenopathy followed by a characteristic brief appearance of a generalized erythematous, maculopapular rash. The transmission of this virus is caused by airborne droplets when infected men and women cough or sneeze. The symptoms range from the appearance of a rash all over the body, fever, and swollen glands, joint pain, irritation, conjunctivitis, etc., Rubella continues to be a commonly transmitted infection in many parts of the world.

Many rubella cases are not recognized, as the rash resembles many other illnesses and up to half of all infections may be subclinical. The disease might have significant complications if the initial illness was contracted in the first trimester of pregnancy, so infecting the fetus and inducing catastrophic impacts, including congenital rubella syndrome (CRS). Congenital rubella syndrome is characterized by microcephaly, cataract, pigmentary retinopathy, microphthalmia, sensorineural deafness, cardiac anomalies mostly like patent ductus arteriosus and pulmonary artery stenosis, intellectual impairment, low birth weight, thrombocytopenic purpura, jaundice, and hepatosplenomegaly.

The United States recorded the elimination of endemic Rubella along with CRS from 2004, and this was continuing through 2011. However, Rubella has been endemic in many parts of the world. Rubella is a vaccine-preventable disease without a particular cure accessible. So the ideal solution to reduce Rubella...
and CRS is vaccination, which has been implemented all around the globe. Large-scale rubella vaccination in the last ten years has nearly eradicated Rubella and CRS in most developed and some developing states. The WHO Region of the Americas has no endemic (naturally-transmitted) cases of rubella infection since 2009. However, roughly a third of the planet’s still deficient of rubella vaccination, including India. Globally, rubella continues to occur, with more than 100,000 cases reported worldwide, especially in countries where routine childhood rubella vaccination is either not available or has just been recently introduced.\(^4\)

Sero-studies conducted in various regions of India are suggestive of the fact that 5 to 67% of women are still vulnerable to Rubella illness.\(^5\) The endemicity of Rubella has been well established in India. Nevertheless, official data concerning the incidence of congenital and acquired rubella illness is not available as rubella illness is not just a notifiable illness. Since CRS, along with other complications, can be avoided through vaccination of non-immune females, so it is essential to ascertain the susceptibility of an adult, adolescent, and non-pregnant females towards the rubella virus. Keeping these things in mind, the study was intended to estimate rubella vaccine coverage among women health professionals and practitioners of childbearing age and its associations using their knowledge, comprehension, known good reasons for not receiving the vaccine, and also the prognosis of unvaccinated issues for prospective vaccination against Rubella. The research comprised women health professionals and practitioners of childbearing age who have been enrolled in a tertiary care centre and a teaching hospital of Indira Gandhi Institute of Medical Science, Patna.

**Method**

**Ethical consideration:** The study was passed from the Institutional ethics committee, letter no. -425/IEC/2018/IGIMS/dated 8/8/2018

The analysis did not demand interventional or invasive procedures.

**Type of research:** The current study was designed as being a cross-sectional study.

**Inclusion criteria for serosurvey:**

- Medical student, interns, nursing students, and working staff.

**Exclusion criteria**

- Pregnant women
- Females with signs and symptoms suggestive of any recent upper respiratory tract infection.

**Data collection**

The participants were interviewed using a structured questionnaire—the proforma comprised of questions regarding essential demographics and understanding of the probability of Rubella during pregnancy. Age of vaccination, vaccination received, and when not, the willingness to have a vaccine against Rubella was likewise listed.

Interpretation of study questionnaire awareness: A lady was regarded as aware of whether she had a proper understanding of the risk of rubella disease and harm to the fetus by Rubella contracted during pregnancy and also the intention of vaccination against Rubella.

Vaccinated: Vaccination status was discovered with the percentage of women who reported a brief history of vaccination at the preschool era or adolescence or later in adulthood.

**Statistical analysis**

Data were coded and listed in the MS Excel spreadsheet application. SPSS v23 (IBM Corp.) was used for data analysis. Descriptive statistics were elaborated in the form of means/standard deviations and medians/IQRs for continuous variables, and proportions and frequencies for categorical variables.

Data were presented wherever befitting data visualization utilizing histograms/box-and-whisker plots/column graphs for continuous data and bar charts/pie charts for categorical data. Group comparisons for continuously distributed data were produced using a separate sample ‘t’ evaluation when you compare two classes. When data was discovered to become non-normally distributed, appropriate nonparametric evaluations in the kind of Wilcoxon tests were also used.

A Chi-squared evaluation was useful for group comparisons in case of categorical data. In an event where the estimated prevalence from the contingency tables has been found to function as <5 for >25 percent of those cells, then Fisher’s Exact Test was used alternatively. Linear correlation between 2 continuous variables was researched using Pearson’s correlation (if the data were normally distributed) and Spearman’s correlation (such as non-normally spread data). The statistical value was retained at $P < 0.05$.

**Results**

A total of 200 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.

In the study, it was found that out of 200 participants, 130 (65%) participants who were medical and nursing students and Interns were aware and had heard about rubella virus infection and 70 (35%) had not; 63 (31.5%) were aware of the mode of transmission, and 68.5% were not aware; 74 (37%) knew about the effect on a future pregnancy, and CRS and 126 (63%) were unaware about it; 72 (36%) were aware that it is a vaccine-preventable disease and 128 (64%) were not aware of it. 108 (54%) were aware of rubella vaccine/R-VAC/MMR, and 92 (46%) were not knowing about it; 74 (37%) of participants were aware of the correct age of vaccination, and 126 (63%) were not aware of it [Table 1].
Out of 200 participants, 65 (32.5%) were aware of their vaccination status (Vaccinated), and 135 (67.5%) were not aware of their vaccination status; 115 (85%) showed willingness for vaccination, and 20 (15%) were not willing for vaccination. Out of these 20 participants not willing for vaccination, 4 (20%) were afraid of the side effects, 6 (30%) felt no need for it, and 10 (50%) had an issue related to family approval [Table 2a-c].

The following variables were significantly associated (p < 0.05) with the variable ‘Rubella’: Age, Region, Education, Profession, Marital Status.

According to Table 3 in our study, it was found that maximum study respondents 145 were in the age group 18-30 years, amongst whom, 125 (86.2%) were aware, and 20 (13.8%) were not aware. Among the 55 participants belonging to 31-40 years age group, only 5 (9.1%) were aware, and 50 (90.9%) were not aware.

Among 79 participants from a rural background, 54 (68.4%) were unaware, and only 25 (31.6%) were aware; Among 121 participants from an urban background, 105 (86.8%) were aware, and only 16 (13.2%) were unaware.

Among the 40 participants belonging to the illiterate class, 40 (100%) were not aware, and among 160 participants belonging to the literate group, 130 (81.2%) were aware, and 30 (18.8%) were unaware.

Among the 138 participants from the upper and middle class, 95 (68.8%) were aware, and 43 (31.2%) were not aware. Among the 62 participants belonging to the lower class, 27 (43.5%) were not aware. Out of 76 married participants, 44 (57.9%) were aware, and 32 (42.1%) were not aware. Among the 124 participants among the unmarried group, 96 (77.4%) were aware, and 28 (22.6%) were not aware.

In our study, awareness about Rubella virus infection, its consequences, and vaccination were significantly (p < 0.001) associated with age, Region, Education, Profession, Socioeconomic status, and marital status.

Pie chart in Figure 1, shows that 45 (69.2%) Medical and nursing students and 20 (30.8%) health care workers who were susceptible to Rubella virus infection were vaccinated.

### Discussion

Rubella has not yet been a disease that has been given prime importance in India though the MMR vaccine was initiated for children of 13-18 months old in certain states of India. The medical students and healthcare workers also lack the fundamental understanding of preventing this disease and its impacts. Out of 145 medical and nursing students who were susceptible to Rubella virus infection were vaccinated.

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**Table 1: Awareness regarding rubella infection among participants (n=200)**

| Awareness               | Aware | Not Aware |
|-------------------------|-------|-----------|
| Heard about Rubella     | 130 (65%) | 70 (35%) |
| Mode of Transmission    | 63 (31.5%) | 137 (68.5%) |
| Affect to future pregnancy | 74 (37%) | 126 (63%) |
| Preventable             | 72 (36%) | 128 (64%) |
| Heard about Rubella vaccine/MMR/R-VAC | 108 (54%) | 92 (46%) |
| Age of vaccination      | 74 (37%) | 126 (63%) |

**Table 2a: Summary of Vaccination Status; n=200**

| Awareness about Vaccination Status | N (%) |
|-----------------------------------|-------|
| Whether Vaccinated (Yes)          | 65 (32.5%) |
| Whether Vaccinated (No)           | 135 (67.5%) |

**Table 2b: Summary of Willingness For Vaccination**

| Willingness for vaccination | N (%) |
|-----------------------------|-------|
| Willingness For Vaccination (Yes) | 115 (85%) |
| Willingness For Vaccination (No) | 20 (15%) |

**Table 2c: Reason for Not Getting Vaccinated n=20**

| Reason for not vaccinated | N (%) |
|---------------------------|-------|
| Afraid of Side Effects    | 4 (20%) |
| Feel no need for it       | 6 (30%) |
| Family Approval           | 10 (50%) |

**Table 3: Socio-demographic Profile of Participants for Rubella infection among Aware and not Aware groups (n=200)**

| Parameters               | Rubella               | P-value |
|--------------------------|-----------------------|---------|
|                          | Aware (n=130)         | Not Aware (n=70)       |
| Age***                   |                       | <0.001³   |
| 18-30 Years              | 125 (86.2%)           | 20 (13.8%)           |
| 31-40 Years              | 5 (9.1%)              | 50 (90.9%)           |
| Region***                |                       | <0.001³   |
| Rural                    | 25 (31.6%)            | 54 (68.4%)           |
| Urban                    | 105 (86.8%)           | 16 (13.2%)           |
| Education***             |                       | <0.001³   |
| Illiterate               | 0 (0.0%)              | 40 (100.0%)          |
| Literate                 | 130 (81.2%)           | 30 (18.8%)           |
| Profession***            |                       | <0.001³   |
| Health Care Workers      | 28 (33.7%)            | 55 (66.3%)           |
| Medical & nursing students | 102 (87.2%)         | 15 (12.8%)           |
| Socioeconomic Status     |                       | 0.089¹   |
| Low                      | 35 (56.5%)            | 27 (43.5%)           |
| Upper/Middle             | 95 (68.8%)            | 43 (31.2%)           |
| Marital status***        |                       | <0.001³   |
| Married                  | 34 (44.7%)            | 42 (55.3%)           |
| Unmarried                | 96 (77.4%)            | 28 (22.6%)           |

³³Significant at P<0.05; ¹Chi-Squared Test
total of 200 participants, 87.2% of medical and nursing students were aware of Rubella, but still, 12.8% were not aware of it. Health care workers, only 33.7% were familiar, and 66.3% were unaware of the disease. In a study conducted by Poornima Sharma et al. on 120 students who were questioned, 100 students knew about Rubella, but 3.3% of students had not heard of congenital rubella syndrome.\textsuperscript{[7]}

Merely medical students understood that principal illness within the first trimester of the pregnancy has a deleterious effect on the growing fetus. The data of primary illness and the trimester of pregnancy is especially crucial as the primary illness within the first trimester of pregnancy may result in congenital rubella syndrome or even instances of abortion and stillbirths.

On checking their comprehension concerning the vaccine against rubella disease, 54% reacted that MMR and RA27/3 vaccine is the most frequent mix to be utilized worldwide.

A research was done by Muhammad Awais Khan et al. in April 2017 had reported the Bad vaccination position in the medical students in addition to the students in different courses. They stated that overall, 12% of students were vaccinated against Rubella while the rest of the 88 percent weren’t vaccinated.

Within our study, 37% have been aware of the age of vaccination involving 1 to 15 years old children, and 63% were unaware of it. In a similar study conducted by Poornima Sharma et al. (2017), 31.6% of students reported awareness with respect to 1-15 years of the age group for vaccination against Rubella. From the current study, overall (32.5%) of these participants were vaccinated, and (67.5%) weren’t vaccinated. From the present analysis, the most familiar attributes for non-vaccination status were anxiety towards side effects (20%), unawareness concerning the necessity (30%), or problems of household endorsement (50%).

Inside our analysis, respondents of 18 to 30 year old had a greater frequency of favorable reaction to questions. However, according to a study conducted by Juliana Costa Vieira et al., among Brazilian adults (2011), respondents belonging to 18 to 25 years of age had the lowest frequency of affirmative response, and the favorable response was higher among the elderly adults.\textsuperscript{[8]}

In our analysis (87.2%) of nursing and medical students were aware of the disease, and just (33.7%) of health workers were aware of that. It was expected to follow the simple fact that they are educated about this in their regular class and have regular interaction with all the gynecologists/doctors.

From the current study, among 65 (32.5%) vaccinated participants, 45 (69.2%) of medical and nursing students, and (30.8%) of healthcare workers were vaccinated. Predicated on knowledge, memory and the proportion of socioeconomic status awareness was more in nursing and medical students when compared to healthcare care workers.

Rubella disease is of more significant concern in medical professionals as they (if not immune) are in danger of contracting it notably against their patients and also can work as a possible vector for the transmission of this virus into the vulnerable patients. Medical experts also set examples for the general population. In accordance with our study outcome, it reflects on the fact that comprehension seeing regular immunization against Rubella is lower among the overall population of India.\textsuperscript{[9]}

The study conducted by Nazeh M Al-abd et al., reveals inadequate Knowledge, Attitudes and Practices (KAP) regarding rubella among preparatory year students attending Aden University.\textsuperscript{[10]}

However, no information is available about awareness of the rubella vaccine in the general population of India.

**Conclusion**

The study reveals that overall, only 65% of medical professionals (students and health care workers) were aware of the disease of the rubella virus, its effects, and only 32.5% were vaccinated, which was considered poor. 87.2% of medical and nursing students had science/literature knowledge. 33.7 percent of healthcare staff were aware of this, and 30.8 percent were immunized. Low recognition and coverage of vaccination among health care staff were due to a lack of education and illiteracy. Having this, it is easy to imagine the mindset of the general population towards that infection.

Furthermore, vaccination coverage among the general population should be encouraged by the government officials to eliminate the rubella infection as it is a vaccine-preventable disease.

So, it is the duty of the primary physician to counsel and aware the adolescent girls and reproductive age women regarding Rubella infection, Congenital Rubella syndrome and its prevention by vaccination.

**Summary**

The research shows the absence of knowledge of rubella virus
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disease and more efforts should be made to raise awareness of this health issue among the general public through more educational campaigns, communication media, and television as a source of information about infection with the rubella virus, its effects, and vaccination.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Key Message

Proper awareness, vaccination, and sero-surveillance may be the key pillars to eliminate this vaccine-preventable disease from our country.

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Conflicts of interest

There are no conflicts of interest.

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