

Coverage of Tetanus Toxoid and Rubella Vaccination among female students of QAMC and IUB, Bahawalpur.

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ABSTRACT

Introduction:

Tetanus also called Lockjaw is a highly characteristic disease caused by Clostridium Tetani found in the soil throughout the tropical and temperate regions of the world. This disease can be prevented by the use of vaccine and developing countries like Pakistan are trying to eliminate this disease by various vaccination programs i.e. vaccination program of reproductive age group women Rubella is a contagious disease caused by a virus. While the infection is mild in children but in pregnant women, it can cause fetal death or severe congenital defects like Congenital Rubella Syndrome (CRS).

Objective:

The objective of the study was to:
1.Determine the vaccination coverage of Tetanus Toxoid and Rubella among female students of Quaid-e-Azam Medical College and Islamia University, university Chowk, Bahawalpur.

Materials and Methods:

Study Design:

Cross sectional descriptive study.

Study Setting:

It was conducted in Quaid-e-Azam Medical College and Islamia University, Bahawalpur.

Duration:

Study was conducted from 1st April, 2016 to 30th May, 2016.

Sample Size

100 Female students were selected for this study. 50 of them from Quaid-e-Azam Medical College and 50 of them from Islamia University, Bahawalpur.

Ethical Issues:

Informed consent was taken from all participants.

Sampling Technique:

It was a convenient sampling method.

Inclusion Criteria:

All the students/girls of reproductive age group (15-49 years) who were willing to participate were included.

Exclusion Criteria:

Not willing to be included in the study.

Data Collection:

Data was collected through preformed pretested questionnaire that comprises of two parts. Part-I includes demographic variables as name, age, class, study institution, residence and part-II consists of study variables i.e. TT coverage and Rubella coverage.

Data Analysis:

Data was entered and analyzed manually. Frequencies and percentages were calculated. The data was presented in the form of tables and graphs.

Results:

The vaccination coverage against Tetanus was found to be 75% while 25% were non-vaccinated. According to the grading of vaccination status, 25% were not vaccinated at all while 73% were partially vaccinated and only 2% were completely vaccinated. The reasons for not being vaccinated were fear (16%), unawareness (68%), bad experience (4%), don't think its useful (8%), others (4%).

The vaccination coverage against Rubella was found to be 12% while remaining 88% were non-vaccinated.

According to the grading of vaccination status, 88% were non-vaccinated while 9% were partially vaccinated and only 3% were completely vaccinated. The reasons for not being vaccinated were unawareness (73.8%), fear (5.6%), bad experience (2.2%), don't think its useful(5.6%), others (12.5%).

Conclusion

About two-third of the female students were immunized against Tetanus. Among them mostly were partially vaccinated. Reasons for not being vaccinated were unawareness, fear and bad experience. Only few students were vaccinated against Rubella. Unawareness, fear and bad experience were the main reasons for non-vaccination.

INTRODUCTION :

Tetanus is an acute fatal disease caused by an exotoxin and highly potent neurotoxin tetanospasmin, which is produced during the growth of anaerobic bacterium *Clostridium tetani*. *Clostridium tetani* is not an invasive organism; infection with *clostridium* remains localized. Tetanus spores are wide spread in the environment. Tetanus bacilli can also enter the body through contaminated puncture wounds and sometimes seemingly trivial injuries. Once inside neurons, tetanus toxin cannot be neutralized by tetanus antitoxin. Toxin accumulates in the central nervous system where it prevents the release of inhibitory neurotransmitters, such as glycine, γ -amino butyric acid, thereby leaving excitatory nerve impulses unopposed.(5)

The major predisposition is lack of maternal vaccination with tetanus toxoid. Immunization of pregnant women with TT induces the formation of antibodies, primarily of the IgG, which passes to the fetus through the placenta and prevents neonatal tetanus. (2,5)

Tetanus that strikes women during pregnancy or within 6 weeks of termination of pregnancy is called maternal tetanus. A significant amount of women die to maternal tetanus every year. Lack of vaccination coupled with deliveries conducted by untrained caregivers in an unhygienic environment with unhygienic birth practices. These conditions allow tetanus spores to contaminate maternal wounds during childbirth and the umbilical cord if cut or dressed after delivery. (2,8)

Operationalization:

The Tetanus Toxoid vaccination was graded as

Non vaccinated Not vaccinated/ 0 vaccine doses received

Partially vaccinated 1-4 vaccine doses received

Completely vaccinated 5 vaccine doses received

In the same way, the Rubella vaccination was graded as

Completely vaccinated 2 vaccine doses received

Methodology

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Data was collected through preformed pretested questionnaire that comprises of two parts. Part-I includes demographic variables as name, age, class, study institution, residence and part-II consists of study variables i.e. TT coverage and Rubella coverage.

Data Analysis:

Data was entered and analyzed manually. Frequencies and percentages were calculated. The data was presented in the form of tables and graphs.

OBERVATIONS AND RESULTS

In this study a simple of 100 female students were taken mean age was (22±7.6). Regarding age distribution 55% female belong to 18-20 year age group, 37% belong to 21-23 years age group and 8% belong to 24-26 years age group respectively.(Table-1)

Among them 50% were form Islamia University Bahawalpur and 50% were from Quaid-e-Azam medical college, Bahawalpur. (Table-2)

Considering their marital status, 97% were unmarried and remaining 3% were married. This study revealed that 75% of them were vaccinated against tetanus and remaining 25% were non-vaccinated. (Fig-1)

Among the 50 students of IUB selected for study, 66% students were vaccinated against tetanus and 34% students were non-vaccinated. While among those 50 students of QAMC selected for study, 84% students were vaccinated against tetanus and 16% were non-vaccinated.

Regarding number of dose of tetanus toxoid vaccine received by the students, only 2.6% students had received complete five recommended dose of TT vaccine. While 10.6% students had received 4 doses, 18.6% students had received 3 doses, 28.1% students had received 2 doses and 40.1% students received 1 dose of TT vaccine. Considering number of doses of TT vaccine received by the vaccinated students in QAMC, only 2.4% students had received complete five recommend doses of TT vaccine, 14.3% had received 4 doses, 19% had received 3 doses, 26.2% had received 2 doses and 38.1% had received 1 dose of TT vaccine.

Considering the number of doses of TT vaccine received by students in IUB 3% students had received complete 5 dose of TT Vaccine while 6% students had received 4 doses, 18% had received 3 doses, 30% had received 2 doses and 42% of them had received only a single dose of TT Vaccine.

According to the grading of vaccination status, from the 100 female students being selected for the study, 25% students were not vaccinated against tetanus while 73% students were partially vaccinated and only 2% of them were completely vaccinated.

The grading of vaccination status of students of QAMC, 16% students were non-vaccinated, 82% students were partially vaccinated against tetanus and 2% student was completely vaccinated.

The grading of vaccination status of students of IUB, 34% students were non-vaccinated, 64% were partially vaccinated while only 2% students was completely vaccinated against tetanus.

The source of vaccination of tetanus toxoid of 75 vaccinated students, 66.7% students had received vaccine from government hospital, 13.3% had received vaccine from private hospital and 20% had received vaccine from LHV.

Comparing the source of vaccination of tetanus toxoid between QAMC and IUB students, being vaccinated. Among the students of QAMC, 71% had received the vaccine from government hospital, and 28.5% of them had received it from LHV. While among the students of IUB, 60.6% received it from government hospital, 30.3% from private hospital, 9.1% received it from LHV.

The reasons for not being vaccinated, 16% were not vaccinated due to fear, 4% had bad experience, 68% of them had not received it due to unawareness while 8% of them thought it was useless and remaining 4% was not vaccinated due to unknown reason.

Comparison the reason of not being vaccinated against tetanus between QAMC and IUB showed that among non-vaccinated

students of QAMC, 62.5% were not vaccinated due to unawareness and 37.5% were not vaccinated due to fear. While among the non-vaccinated students of IUB, 70.6% were not vaccinated due to unawareness, 5.9% were not vaccinated due to fear, 5.9% due to bad experience and 11.7% of them thought it was useless and 5.9% had other reasons. (Table-7)

The students were also asked about the vaccination status against rubella. Among them only 12% students were vaccinated against rubella while remaining 88% were not vaccinated. (Fig-9)

Among the students of IUB, only 8% were vaccinated against rubella while remaining 92% were non-vaccinated. However among the students of QAMC, only 16% were vaccinated and 84% were non-vaccinated. (Fig-10)

Regarding the number of doses of rubella received by the vaccinated students of IUB & QAMC, only 25% of them had completed the course of 2 doses while the remaining 75% had received only a single dose. (Fig-11)

Regarding the number of doses received by the vaccinated students of QAMC, only 62.5% of them had completed the course of 2 doses against rubella while remaining 37.5% of them had received only a single dose. (Fig-12)

Regarding the number of doses received by vaccinated students of IUB, 100% of the vaccinated students had received only a single dose of rubella

vaccine. 0% had completed the recommended course of vaccination. According to the grading of the vaccination status of rubella, 88% were non-vaccinated, while 9% were partially vaccinated and only 3% were completely vaccinated against rubella.

The grading of the vaccination of students of QAMC, majority of them 84% were non-vaccinated, 10% were partially vaccinated while only 6% were completely vaccinated.

The grading of the vaccination of students of IUB, a majority of them 92% were non-vaccinated against rubella, 8% were partially vaccinated while 0% were completely vaccinated against rubella. Regarding the source of vaccination of rubella among the vaccinated students, 75% had received the doses from government hospital and 25% had received it from Private hospital.

Among the vaccinated students of QAMC, 87.5% had received the vaccine from government hospital and 12.5% had received it from private hospital. While among the 4 vaccinated student of IUB, 50% had received it from government hospital and 50% had received it from private hospital.

Regarding the reasons for not being vaccinated against rubella, among the non-vaccinated students, 73.8% were not vaccinated due to unawareness, 5.6% due to fear, 2.2% due to bad experience and 5.6% of them thought it was useless, while 12.5% due to other reasons. (Table-10)

Among non-vaccinated students of QAMC, 71.5% were not vaccinated due to unawareness, 9.5% due to fear, 2.4% due to bad experience and 7.1% of them thought it was

useless, while 4 (9.5%) of them were not vaccinated due to other reasons. While among non-vaccinated students of IUB, 76.1% were not vaccinated due to unawareness, 2.2% due to fear, 2.2% due to bad experience, 4.3% of them thought it was useless while 15.2% of them were not

vaccinated due to other reasons.

Table-1: Age distribution of students

Age in years	Frequency	Percentage
18-20	55	55%
21-23	37	37%
24-26	8	8%
IUB	50	50%
Total	100	100%
QAMC	50	50%
TOTAL	100	100%

Table-2: Number of students selected from college/university

Discussion:

Tetanus is still a major health problem in developing countries and it is associated with high morbidity and mortality. Pakistan is a high-risk country regarding Tetanus. WHO recommends that 90% of the females should be vaccinated against Tetanus in developing countries.

A study was conducted in QAMC and IUB in 2016 regarding knowledge and practice of TT vaccine. 100 females of child-bearing age lying in age group (22 ± 7.6 years) participated. Among them 3% were married and 97% were unmarried. Only 2% were completely vaccinated, 73% were partially vaccinated and 25% were not vaccinated. Among those who were partially vaccinated, 30 students received one dose, 21 received two doses, 14 students received three doses, 8 received four doses. Top most cause of not being vaccinated was unawareness(68%), while other causes were fear(16%), bad experience(4%), people think that it's not useful(8%) and due to some other causes were 4%. (1,2,6)

Among those who were vaccinated; majority got vaccinated through Government hospitals (66.7%), some got vaccinated from private hospitals(13.3%) and some from LHVs (20%). (4)

In our study, coverage for complete immunization was 2%, while similar results were found in Nigeria, where coverage for complete immunization was also 2%. While in the study conducted in Dhaka results for

complete immunization were 11%. Similarly the results were

found to be 20.9% in Yemen and results found in a Dhaka university were 34.5%. In a similar study conducted in 11 colleges and university of Karachi, the results for the coverage of complete immunization was found to be 2.9%. (6)

While in Peshawar, it was found to be 55.65%. The least results were found in Karachi, Bahawalpur and Nigeria. Top most reason might be the "unawareness" among people of these areas. Moderate coverage was found in Dhaka, Dhaka university and Yemen due to relatively better knowledge and facilities. While very high coverage was found in Peshawar because the study also included pregnant ladies, better ante-natal care, better LHV efforts, better schedule of LHW and LHV visits, favorable and cooperative attitude from health care providers. (6)

In our study, coverage for partially immunized was 73% while in Port-Harcourt university, coverage for partial immunization was 58.2%. In Yemen, it was 11.69%, in Dhaka university, results were 24.8%. In colleges and university of Karachi, it was found to be 39.8%. (5)

The reason behind high proportion of females on schedule for vaccination might be the medical education, 50% of the sample students are medical students, they have better knowledge and guideline from their instructors. There are better immunization programs and there is better accessibility to

health care institutions for both the institutions QAMC and IUB.

There are better health seminars and increased distribution of published handouts relating

health issues. Whereas, moderate coverage for partial immunization was found in Port-Harcourt university. The reason being located in the capital of the country(Nigeria), where the better facilities are provided to the residents, more awareness and more number of public health institutions. It is an educational institution as well which might also be a reason where health education is promoted. (4)

The least coverage for partial immunization was found in Yemen, Karachi and Dhaka. The reasons might be unawareness, lack of proper instructions, difficult follow-up, inconvenient place and time, unsuitable schedule, being busy, lack of cooperative and favorable attitude by the client and the health care providers. The other vital reason might be lack of political commitment and lack of resources. (2)

In our study, the top most reason for not being vaccinated was unawareness, other reasons following were fear, bad experience, people don't think it's useful. While in Nigeria, the level of unawareness was found to be very high, while in Port-Harcourt university, level of unawareness was low. In Dhaka university, half of the sample population was unaware, other causes found were lack of information about time and place, inconvenient schedule of vaccination. While in educational

institutions of Karachi, unawareness was found to be 16.32%.

While in Peshawar, the level of unawareness was moderate. The other reasons for not being vaccinated were being busy, distant health centers, misconceptions and fear of side effects.

The reason behind unawareness might be lack of health education programs in universities and colleges, lack of proper instructions, lack of published handouts and health seminars, lack of proper dedication and favorable attitude by outreach teams and health care providers, ineffective role of LHWs. The reasons for low level of unawareness in Port-Harcourt university were proper health educational programs, proper dedication by client and health care providers, effective role of LHWs awareness and proper instructions. (7)

There is little epidemiological data available in Pakistan regarding susceptibility to rubella in pregnancy and incidence of CRS (congenital rubella syndrome) in newborns.

The coverage was found to be low and among them, three-fourth were partially immunized and only one-fourth were completely vaccinated. While in Ujjain (India), coverage was found to be 42.1%. Similar study was conducted in Aga Khan University on pregnant ladies, coverage was found to be 84.2%. (9)

The coverage of MMR in Saudi Arabia, 16 years after the introduction of MMR into the EPI, was found to be 91%. In a study conducted in Zhejieng province in China, less

than 30% of adults aged 15-39yrs received one dose of RCV (Rubella containing vaccine). Rubella seropositive rates were lower in young adults and older adolescents. In females aged 20-29yrs

the seropositivity due to vaccination was significantly lower than males. In Mumbai the MMR coverage was 66.4% which is within the recommendations from WHO. In Abbottabad, school girls aged 10-19 years the status of RV IgG was 94% positive. In Nishtar nursing college the coverage of vaccine was 0 out of 168 students. Whereas the natural immunity shown by seropositivity for Rubella IgG was 93.3%. This means all the seronegative young females are the ones who are susceptible the Rubella and at risk of contracting Rubella during pregnancy.(17)

The main reason was unawareness, other reasons followed are lack of health education programs, lack of proper guidance, lack of cooperative and favorable attitude, lack of disease related seminars, deficient role played by media. (10)

The 2/3rd population was unaware about Rubella vaccine while other causes for not being vaccinated were fear, bad experience, people don't think its useful and some other reasons. While in Ujjain (India), unawareness was very low. The reasons for high level of unawareness in Pakistan was due to lack of role played by media, lack of health education programs, inefficient role play by the health care providers and lack of published literature regarding health issues. While in Ujjain, the level of unawareness was

very low due to proper instructions and awareness, favorable attitude, dedication and devotions by the health care providers, monthly health educational programs arranged by the university and college administrations and a good political support, availability of abundant funds, better resources and proper monitoring and evaluation. (13)

In Saudi Arabia the reason for 8.7% of women being seronegative is thought to be because of absence of vaccination program or inaccessibility or an incomplete antibody response or a decline in antibodies overtime (as occurs after vaccination or natural infection). In Zhejiang Province of China the reason for lower coverage of rubella vaccine despite being introduced as MMR into EPI was due to the epidemiological shift that resulted in more disease burden. This is because if the vaccination coverage is insufficient a vaccination program works to decrease the circulation of virus in the community. This results in decreased chances of developing immunity by the natural infections. Paradoxically this can cause even more prevalence of CRS cases in population. In India the coverage was within the recommended percentage. This is because of the good infrastructure and health policies that give more importance and budget to the immunization program. The introduction of MMR when paired with effective long term strategies can lead to significant decrease in rubella prevalence in a population. In Abbottabad there was higher seropositivity which not necessarily shows higher coverage of vaccination among

them. It can also be due to a recent epidemic or endemic of rubella within the area. Nevertheless being a more educated place the higher coverage can also be due to high awareness within the population, lack of fear due to literacy, better health education or due to the local NGO work. In Nishtar a shocking zero percentage was vaccinated for Rubella. This is most probably due to lack of awareness whereas the high seropositivity despite no vaccination history indicates that the Rubella infection is prevalent in Multan population. (18)

Conclusion

About two-third of the female students were immunized against Tetanus. Among them mostly were partially vaccinated. Reasons for not being vaccinated were unawareness, fear and bad experience. Only few students were vaccinated against Rubella. Unawareness, fear and bad experience were the main reasons for non-vaccination.

Recommendations

- Awareness and instructions regarding timely completion according to the schedule should be stressed by the health care providers.
- Letters and computer-based reminders to clients by the physicians should be given.
- There should be regular home visits by the LHW regarding TT and Rubella vaccination.

- Health education programs should be conducted in colleges and universities for awareness of vaccination programs and schedules.

- Rubella should be added in EPI (can be easily added with the Measles vaccine at 9th and

18th month with minimal cost causing increased reduction in CRS.

- Evidence collection via surveillance system to estimate the incidence and burden of congenital Rubella so that national Immunization program can be added for more benefit where it is needed.

- Rubella serology should be checked by Obstetricians even if they have previously been vaccinated.

- Rubella vaccine should be provided to both medical and nursing students before they enter wards to help prevent hospital based outbreaks and also to protect against CRS.

References

1. Orimadegun AE, Adepaju AA, Akinyinka OO. Adolescent girls' understanding of tetanus infection and prevention. Implications for disease control in Nigeria. FPUBH. 2014; 2: 1-7.
2. Alex Hart BA, Okoh BAN. Awareness and status of tetanus toxoid vaccination among female

- undergraduate students in a Nigerian university. IJTDH. 2015; 7(1): 6-15.
3. Perry H, Weierbach R, Hussain I, Islam R. Tetanus toxoid immunization coverage among women in zone 3 of Dhaka city, the challenge of reaching all women of reproductive age in urban Bangladesh. BWHO. 1998; 76(5): 449-457.
 4. Dallak AM, Al-Rabeei NA. Tetanus vaccination among reproductive age group females in Sana'a city Yemen. SUJMS. 2014; 4 (1): 95-100.
 5. Choudhury R, Mukherjee A, Lahiri SK. A study on the knowledge of tetanus immunization among interneers in a government medical college of Kolkata. NJCM. 2011; 2(1): 432-439.
 6. Tanjida S, Huq SMA, Sudhira B, Nahida S. Status of knowledge and practice about complete tetanus toxoid immunization of unmarried female students of a public university. BJMS. 2009; 8(2): 102-109.
 7. Qadir M, Murad R, Mumtaz S, Azmi AA, and others. Frequency of tetanus toxoid immunization among college/university female students of Karachi. JAMCA. 2010; 22(1): 147-149.
 8. Naeem M, Khan MZ, Abbas SH, Adil M, and others. Coverage and factors associated with tetanus toxoid vaccination among married women of reproductive age. A cross sectional study in Peshawar. JAMCA. 2010; 22(3): 136-137.
 9. Gupta H, Sabde Y, Khandelwal V, Mehta S. Rubella vaccine awareness alone cannot influence the attitude of people. A cross sectional survey among medical students and professionals in Central India. IJMSPH. 2013; 2(3): 572-577.
 10. Valsan C, Rao T, Raji P. Prevalence of rubella immunity in female health care students. TIJI. 2008; 7(2).
 11. Aksakal FN, Maral I, Cirak MY, Aygun R. Rubella seroprevalence among women of child bearing age residing in a rural area. is there a need of rubella vaccination in Turkey? JPN J Infect. Dis. 2007; 60, 157-160.
 12. Rasul S, Khurshid M, Rizvi J, Rizvi S. Rubella susceptibility and continuing risk of infection in pregnancy. JPMA. 1990; 40.
 13. Hashmi FK, Islam M, Khan TA, Tipu MK. Vaccination coverage of mothers during pregnancy with tetanus toxoid and infants after birth. Pak J Pharm. 2011; 24(2): 35-39.
 14. Langlano E, Ferrara M, Lanni L, Atrei P and others. Rubella seroprevalence in childbearing age women. A cross sectional study in the province of Frosinone central southern Italy. IJPH. 2009; 6(3): 194-200.
 15. Kodali RR, Peesapati S. A comparative KAP study on rubella and its vaccination among medical and non-medical college girl students of Vijayawada India. IJMCH. 2015; 17(1): 1-6.

16. Gavi partners forum. 4-6 December 2012. Dar es salaam. Tanzania.

17. Alsibiani SA. Rubella immunity among pregnant women in Jeddah western region of Saudi Arabia. HPCOBI. 2014; 2014: 6.