

ASSOCIATION OF MATERNAL TETANUS TOXOID (TT) IMMUNIZATION IN PREGNANCY WITH AGE APPROPRIATE IMMUNIZATION COVERAGE OF THEIR CHILDREN UNDER ONE YEAR AGE.

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ABSTRACT

Objective: To establish the association of maternal tetanus toxoid (TT) vaccination in pregnancy with age appropriate immunization coverage of their children less than one year of age.

Methodology: The study was conducted in both urban and rural areas of Peshawar. WHO recommended (30x7) stratified multi stage cluster sampling technique was used for data collection. Seven children of age less than one year and their mothers were included per cluster to make total sample size of 210. A well designed questionnaire was used as data collection tool. Children with any contraindication to vaccine and those living away from their mothers were excluded from the study. Prior consent was taken from mothers after explaining the purpose of the study. BCG scars, Ante natal cards of mothers and immunization cards of children were checked for their coverage status. In case of non availability verbal inquiry was made. The data was analyzed by SPSS version 16 and results were presented in form of tables and graphs.

Results: Results of the study shows that (TT) immunization of mothers in pregnancy was significantly associated positively with age appropriate EPI coverage of their children less than one year of age ($p < 0.001$). The immunization status of completely immunized children were 70.7%. while TT immunization coverage of mothers were 62%. other factors affecting immunization status positively were parents education, socioeconomic status and area of living (urban). major factors leading to failure of utilization of EPI services were family matters, parents busy schedule and fear of side effects.

Conclusions: Maternal TT vaccination in pregnancy is significantly associated with age appropriate EPI coverage of children less than one year age which reflects the health seeking behavior of a more conscious mother making good health choices for herself as well as for her child.

Key Words: maternal TT vaccination, age appropriate EPI coverage,

INTRODUCTION

Immunization is a highly cost effective health intervention in existence, but the morbidity and mortality in children due to vaccine preventable diseases is still very high in Pakistan due to lack of awareness and failure of immunization.¹

The cost of treating diseases can be significantly reduced by immunization of children against the vaccine preventable diseases.² In the last few decades the immunization coverage rate have improved sufficiently in developed countries thereby conferring herd immunity,

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whereas most of the developing countries are still far beyond to achieve this level.¹⁻³

One of The leading causes of high mortality and morbidity of children in developing countries is still vaccine preventable diseases and the probable reason could be the low level of immunization coverage rate to achieve the threshold for herd immunity.⁴

In south Asia the coverage rate of immunization in children has increased from about five percent in 1970 to about 50%. But still almost half of the children remain UN immunized. About two million deaths per year occur in the world mostly in developing countries due to vaccine preventable diseases.⁵

Tetanus is a vaccine preventable disease that causes thousands of death each year majority of the mortality and morbidity from tetanus occur in developing countries without an immunization program.^{6,7} Lack of maternal immunization against tetanus is the single most important causative factor.

Neonatal tetanus, caused by *Clostridium tetani*, is the second leading cause of death from vaccine-preventable diseases among children world-wide 8 if a mother will not receive the correct number of doses of tetanus toxoid vaccine, she and the expected child both are not protected against tetanus at delivery and are at high risk to develop this deadly infection. Pakistan is one of the high burden countries which account for about 26400 deaths each year from neonatal tetanus (NNT) 9

Researchers have carried out studies to find out the reasons for poor coverage of EPI in children. Beside other causes parental awareness and their beliefs on immunization have been found to be responsible to affect the immunization coverage rate. ¹⁰A KAP study conducted in china found that the knowledge of mothers regarding EPI was less and coverage in children was low. Beside other factors they found that mother's education and age were the main factors responsible for this low coverage rate in their children. ¹¹In another study conducted at china they found that the immunization coverage rate in children is directly associated with parent's knowledge. ¹²the same kind of association was found in a study conducted in Italy. ¹³ A similar study was conducted in Pakistan to find out the reasons for not immunizing the children and the results showed that parent's laziness, uncooperative husbands and poor quality of services by the staff were mainly responsible for low coverage of immunization. ¹⁴In Peshawar a study was conducted to assess the TT coverage of women 15 to 50 years (Reproductive age). Results showed that about 65% of women of this age group were immunized and their coverage was influenced by the extent of information about TT vaccination to them. ¹⁵Another study was conducted about the immunization coverage in three districts of KPK and the results showed that 65% of children were fully immunized. ¹⁶

The main purpose of this study is to assess EPI coverage of children less than one year age and tetanus toxoid coverage of their mothers in district Peshawar and to establish the impact of TT vaccination of mothers in pregnancy over the immunization status of children. This study will also help us to improve the immunization coverage by rectifying the key factors for poor immunization status in the study population in present scenario and will enable us to know the about the protection offered by the vaccines used in EPI.

MATERIALS AND METHODS:

It was a cross sectional study conducted at both urban and rural areas of district Peshawar for duration of six months i.e. from 1st august 2013 to 30th Jan 2014. WHO recommended (30x7) stratified multistage cluster

sampling technique was used as guide line to assess the immunization status of children and their mothers. ¹⁷ Random numbers list will be utilize to select 30 union councils as clusters among four towns of district Peshawar. Out of each union council seven villages will be selected through simple random technique. Out of each cluster (village) seven households will be chosen by systematic sampling. Seven children of age less than one year and their mothers will be included per cluster to make total sample size of 210. Children with any contraindication to vaccine and those living away from their mothers were excluded from the study.

A well designed questionnaire was used as data collection tool. In case of non availability of study unit, next home was approached. Information regarding basic demography, immunization coverage of mother and child, socio-economic status, reproductive history, and health services utilization, and reasons for non-compliance with the EPI schedule were collected from the mothers after a prior consent. Research assistants were trained on questionnaire to explain each question to the respondents. Immunization cards of the children were checked for EPI coverage. Their BCG scars were also checked. Ante natal cards of mothers if available were checked for TT immunization during pregnancy and if not available they were inquired verbally.

The data was analyzed by statistical program for social sciences (SPSS) and results were presented in the form of tables and graphs. Summarization of the main variables; Vaccination status of each child was compared against the recommended EPI schedule for his or her age and each child was labeled as either appropriately vaccinated or not. TT immunization status of mothers was assessed and was compared against the EPI coverage of their children. Time since marriage of mothers was recorded in number of years with one year increments. Socio-economic status was assessed by monthly income of house hold, education status and nature of job the educational status of both parents was recorded as separate variable. For the purpose of analysis, all mothers of children and their husbands were categorized into two main groups, literate and illiterate. The literate categories for both parents were consist of all those who could read and write (even if they had no formal education).

Statistical analysis of data was done by using t test and chi square test through computer software SPSS version16.p valve of less than 0.005 was taken as significant at 95% confidence level.

RESULTS

The study found the following results which are

Table. 1 Immunization Coverage of Children and TT Immunization of Mothers

Immunization Status of Children	Number	Total	Percentage
Completely Immunized	148	200	70.47%
Partial or Not Immunized	62		29.52%
TT Immunization Coverage of Mothers	No	Total	Percentage
Yes	130	210	62%
No	80		38%

Table.2 Association of Mother TT Immunization with Immunization status of Children

TT Immunization of Mothers	Immunization Status of Children		Total	Chi Square	DF	P Value
	Completely Immunized	Partial or Not Immunized				
Yes	124 (95.4%)	6 (4.6%)	130	148.31	1	Less than 0.001
No	24 (30%)	56 (70%)	80			
Total	148	62	210			

Table 3. Association of Various Factors with Child Immunization

Variables		Partially or Not Immunized	Completely Immunized	Total	Chi Square	DF	P Value
Mother Education	Edu	39	141 (78.3%)	180 (85.7%)	54.43	1	Less than 0.001
	Un Edu	23	7	30			
Father Education	Edu	61	146 (70.5%)	207	6.42	1	0.026
	Un Edu	2	4	3			
Father Occupation	Work	58	147 (71.7%)	205	6.127	1	0.025
	Not Work	4	1	5			
Area of Living	Urban	21	112 (84.2%)	133	44.85	1	Less than 0.001
	Rural	41	36	77			
Gender	Male	39	87 (69%)	126	0.686	1	0.439
	Female	22	62	84			

presented in tabular form for the purpose of easy understanding and analysis.

The age appropriate immunization coverage of children under study was 70.47% while the tetanus toxoid (TT) coverage of their mothers during pregnancy was 62 %.(table.1).

Maternal TT vaccination during pregnancy was found to be associated significantly with the age appropriate immunization coverage of their children less than one year with p value of less than .001. (P< .001). (Table. 2).

Maternal education and area of living (urban residency) were the other factors positively associated with the age appropriate EPI coverage of children with

p value less than .005. (table.3).

Factors like father education, occupation, and socioeconomic status of house hold and gender of the child were also analyzed and were found to have no significant association with the age appropriate EPI coverage of children.

Busy schedule of parents, family matters and fear of side effects of vaccines were major factors leading to failure of utilization of EPI services.

DISCUSSION

On the basis of our results we found a significant association between TT immunizations of mothers during pregnancy with age appropriate EPI coverage of their children less than one year of age. Our study shows

95 % (124) of children of TT immunized mothers were completely immunized as compare to 30 % (24) children completely immunized of mothers who had no TT immunization during their pregnancy. This shows that mothers who had TT immunization had more awareness and were able to completely immunize their children as compare to those who had no TT immunization. A community based study done by N. Siddiqi in Karachi also showed same significant association.¹

our study shows 62% (130) TT immunization coverage of mothers in the given sample which is quiet less in comparison to developed countries which could be due to less awareness regarding TT vaccination of mothers and because of which increase in number of neonatal and maternal tetanus cases and deaths. While in Karachi study done by Siddiqi showed 57.3% TT immunization coverage of mothers (1) and other study done in Peshawar by Naseem Khan Afridi in 2002 showed 65% TT immunization coverage among females of reproductive age in Peshawar, which is close to our study results.²

Age appropriate EPI coverage of children under one year was 70.7 % (148) completely immunized and the rest 29.3% (62) were partial or not immunized. It is quite encouraging as compare to neighbor developing countries (India and Afghanistan) but still could not reach to the level of herd immunity as compare to developed countries. In Siddiqi's study in Karachi it was 45% (1) which is less than our study because of the fact that in our study all children were either admitted in tertiary care hospital or were brought up to outpatient department where vaccination facility is available while the later study was community based and children were in their homes during study time. Another study done in three districts of NWFP (now KPK) showed 65% completely immunization coverage of children which was also a community based study.⁽³⁾ This shows that EPI programme is improving day by day and there is increase in awareness about health and about utilization of immunization services.

Regarding factors associated with immunization coverage of children, parents education particularly maternal education was significantly associated with it with p value less than 0.001. While in Siddiqi's study in Karachi¹ also parents education were significantly associated with children immunization coverage. Another study done in UGENDA shows a significant association of mother education level with immunization status of their children⁴. This shows that educated parents have more awareness and capability to immunize their children.

With reference to gender discrimination, data

was collected to see the immunization coverage of both gender and to our pleasant surprise we found in our study no gender discrimination in immunization coverage and both gender have equal immunization. It is so an impression in our society that females are less vaccinated than males while in our study there was no significant association of more immunization coverage of males than females.

Area of living (urban or rural) was also affecting immunization coverage of children. 84.2% children living in urban area were completely immunized as compared to 47% of living in rural area, which showed a significant association of area of living on immunization status. It is because of the fact that people living in urban area were having more awareness to health education and easy access to the health care facilities as compare to people living in rural areas. A study done by M. Naeem in Peshawar in 2011 showed completely immunization status of children living in urban area was 76.5% as compare to 48.8% of rural areas.⁵

Regarding factors leading to failure of utilization of EPI services, busy schedule was responsible in 26% children; family matters were responsible for 22% children and fear of side effects were responsible for 10% of children. while in Ahmad Nisar study of immunization coverage³ the factors leading to failure of utilization of EPI services were, no faith on immunization, need of second and third dose, mother too busy and absence of vaccinator. Since that study was done in 1999 and after that a lot of emphasis has been given on immunization programmes which have created awareness due to which immunization facilities have been enhanced.

CONCLUSIONS

Mother TT immunization is significantly associated with age appropriate EPI coverage of children under one year which reflects the health seeking behavior of a more conscious mother making good health choices for herself as well as for her child.

Completely immunization coverage of children is 70.7% and TT immunization coverage of mothers is 62%. Parents education is related with immunization status of their children. The more educated the parents the more is chances of completely immunization of their children.

People living in urban area have more completely immunized children as compare to rural area. Due to availability of health services and more awareness and easy approach. No gender discrimination is there in immunization status of children. Both male and female children are immunized equally.

Major factors responsible for failure of utilization of EPI services are family matters, busy schedule of parents and fear of side effects of vaccines.

RECOMMENDATIONS

Emphasis should be made to create more awareness regarding the importance of TT immunization in mothers so that the health seeking behavior of a more conscious mother making good health choices for herself as well as for her child.

The community should be approached through all levels i.e. regulatory, services and educational to facilitate immunization of children.

Government should take measures through mass media to remove the fear and false beliefs of people regarding the side effects of vaccines created by quacks and religious leaders.

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