

Original papers

Evaluation of the rubella immunization programme in the Polonnaruwa district.

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Abstract

Objectives : To evaluate the rubella immunization programme in Polonnaruwa district by assessing the coverage, adverse effects as perceived by clients including complications of pregnancy following vaccination, centres providing services and prevention of pregnancies in the immediate post vaccination period.

Methodology: A community based cross sectional survey was carried out to collect data from 700 eligible women in the age group of 11-44 years, selected from 20 clusters. The study instrument was an interviewer administered questionnaire.

Results: The overall immunization coverage was 70%. Although the coverage in 11-15 years (92%) and 16-44 years (64%) was higher than the target of 80% and 60% respectively, with the increase of age, proportion of non-immunized women increased. The commonest adverse effect reported by clients was low-grade fever (4%) followed by sore throat (2%) and joint pains (1.6%). The private sector and public curative institutions provided only 2% of vaccinations. The proportion vaccinated in the pre-conceptional period was 98%. No one had been immunized during pregnancy nor were there conception within three months following immunization. The majority (88%) of married women who were at risk of pregnancy in the immediate post vaccination period used or adopted a method of contraception, the commonest of which was Depot Medroxy Progesterone Acetate. Adoption of a method during post partum vaccination was 100%.

Conclusions: Coverage in the two main target groups was well above the target of 80% in 11-

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Immunization activities carried out utilizing school health programme were highly successful. Efforts are needed to screen those who were missed out and immunize them at schools, family planning and well women's clinics. All non immunized, post partum mothers can be immunized in the post partum period. The curative institutions in the public sector and the private sector need to be actively involved in immunization against rubella, with more emphasis on curative institutions with obstetric facilities for post partum vaccinations. Finally, a reporting mechanism for adverse effects following immunization should be implemented for out-door patients and general practice.

Key words : Rubella, immunization, evaluation,

Introduction

Rubella is almost always a mild disease without permanent sequelae. However, the consequences of the infection may be severe if a pregnant woman contracts rubella in the first trimester. The disease acquired during this period leads to generalized, persistent rubella infection of the foetus and the child may be born with gross congenital defects, mainly of the eye, heart and ear known as the Congenital Rubella Syndrome (CRS).

Rubella is a problem in Sri Lanka too. According to a study carried out in 1989, the susceptibility of Sri-Lankan women to rubella virus was 43%. This figure varied from district to district. High susceptibility to rubella, cases of pregnancies complicated with rubella and congenital heart defects among pre-school children at an age when a retrospective diagnosis was impossible, prompted some scientists to recommend the implementation of a program of vaccination against rubella with MMR vaccine in 1989 (1).

Immunization against rubella was introduced into the national programme of immunization in August 1996 with the objective of preventing CRS by immunizing susceptible females. The selective strategy was adopted with the hope that the quickest impact would occur if susceptible women with reproductive potential were vaccinated. Schoolgirls in the age group of 11-15 years and females with childbearing age group of 16-44 years were identified as target groups (2).

The rubella immunization programme commenced in the district of Polonnaruwa in December 1997. Since the introduction of the programme in the district, ill effects of immunization and termination of pregnancies associated with rubella immunization have been reported. Termination of pregnancies following vaccination places the lives of these women at risk. This perceived association between pregnancy following vaccination and teratogenicity following vaccine induced rubella and reports of terminated pregnancies raise doubts as to whether counseling services prior to immunization were adequate. Some professionals including medical officers in the district were reported to have refused to vaccinate eligible women due to fear of conception in the post vaccination period. Increased incidence of pregnancies and high prevalence of termination too were reported. These factors have adversely affected the rubella immunization programme and might have contributed to increased wastage of vaccine (3). Considering these facts, an evaluation of the rubella immunization programme in the district was carried out to assess immunization coverage, adverse effects as perceived by clients, service provision, prevalence of pregnancies following vaccination and the counseling programme to prevent pregnancies in the immediate post vaccination period.

Methodology

The study population comprised eligible women for rubella immunization in the age group 11-44 years residing in the district. The calculated sample size was 700. The sample was stratified into two groups based on the proportion of two age groups classified in the National Immunization Programme (11-15 years - 6%, 16-44 years - 24 % of the total population). Thus, 560 from the age group 16-44 years and 140 from the 11-15 year age group were proportionately selected using the cluster sampling method. This sampling technique was given preference over simple random sampling due to the non availability of an accurate sampling frame. A Public Health Midwife area was selected as a cluster and 20 clusters were randomly selected for the study. Thirty-five study units were selected from each cluster to obtain the desired sample size of 700.

A pre- tested, structured, pre- coded and interviewer administered questionnaire was

utilized to collect data. Six Public Health Nursing Sisters assisted the principal investigators to administer the data collection instrument. They were given an intensive training in interviewing methods. The visits were timed to meet working women and school girls, and house to house visits were done to avoid "volunteer bias". To confirm the accuracy of data, re-test of a randomly selected 5% of the sample was carried out by the principal investigator. Only a few minor inconsistencies were found. Informed consent was obtained from all respondents. In the event of children being interviewed, consent was obtained from parents to interview girls between 11-17 years.

Results

A total of 700 eligible females were studied to identify their immunization status. The overall rubella immunization coverage was 69.70% (95% CI, 66.30-73.10). Coverage in the age group 11-15 years was 92.86 % (95%CI, 88.66-97.06) ; the corresponding figure for the age group 16-44 years was 63.90% (95% CI, 60-67.80%).

Table 1. Distribution of vaccination status of eligible females for rubella immunization by age in years

Age in years	Vaccinated (%)	Unvaccinated (%)	Total
11-15	130 (92.85%)	10(7.15%)	140
16-20	130 (84.96%)	23(15.04%)	153
21-25	91 (80.53%)	22(19.47%)	113
26-30	65 (59.09%)	45(40.91%)	110
31-35	48 (59.25%)	33(40.75%)	81
36-40	13 (22.80%)	44(77.20%)	57
41-44	11 (23.91%)	35(76.09%)	46
Total	488 (69.70%)	212(30.30%)	700

Table 1 shows that with the advancement of age, the proportion of vaccinated women gradually decreased. In the age group 11-25 years; vaccination coverage is above 80%. The corresponding figure in the age group above 35 years is less than 25%.

All vaccinated clients were further studied to identify adverse effects commonly experienced by them following immunization, only 4% (n=488) experienced at least one adverse reaction. The most frequent adverse effect was low-grade fever (n=20, 4.09 %). Sore throat and joint pains were reported by 2% and 1.6% respectively. Rash was reported to be less

common (n=4, 0.41%) Other adverse effects were negligible.

Table 2. Distribution of the timing of vaccination (n=488)

Period	Frequency	Percentage
Pregnant	00	00%
Non pregnant	479	98.15%
Post partum	09	1.85%
Total	488	100%

No client had been inadvertently vaccinated during pregnancy. Almost all vaccinations had been performed during non-pregnant period (98%). None of the clients interviewed had conceived within three months following vaccination. Vaccination during the post partum period was minimal.

Immunized females were interviewed with a view to identifying centres that provided rubella immunizations. Number of rubella vaccinations performed in Primary Health Care clinics was 282 (58%). Through school health programmes 194 (39%) vaccinations had been provided. At government hospitals, private medical centers and working places, vaccinations had been provided to 9 (1.8%), 2 (0.4%) and 1(0.2%) clients respectively.

Out of all vaccinated women, the married women (n=180) were interviewed with regard to the use of a method of family planning.

Table 3. The use of family planning methods by married clients at the time of vaccination (n=180)

Use of a FP method	Frequency	Percentage
Using a method	146	81.11%
Adopted a method	12	6.66%
Neither used nor adopted	22	12.23%
Total	180	100.00%

Eighty one percent were already using a method and at the time of immunization 7% adopted a method. All nine clients vaccinated in the post-partum period adopted a method of contraception

Discussion

In the literature, two approaches namely service statistics and community-based surveys are generally used to evaluate programmes (4). Though it is feasible and less expensive to

use service statistics for programme evaluation, deficiencies in the present information system, non availability of statistics for un staffed areas, Socio-demographic and other relevant information of clients, gross under reporting of adverse effects following immunizations, non-reporting of immunizations carried out by the private sector, inadvertent vaccinations during pregnancies and clients becoming pregnant within 3 months following vaccination by all medical practitioners limit the use of routine service data and justify the use of a community-based survey to evaluate a programme in a defined area.

The study demonstrated that the coverage of vaccination among eligible females in the age group 11-15 years and 16-44 years was 93% and 64% respectively. Although the coverage for two main target groups is high and well above the target of 80% (11-15 years) and 60% (16-44 years) set by national authorities, studies have shown that when the selective strategy is used, 100% coverage of target population is required to eliminate CRS as the virus is always or frequently present in the community. Thus, 100% coverage should be ideal. In the West, notably in the UK, CRS occurred among infants born to susceptible women and selective strategy succeeded in partially eliminating CRS even when 2-3% remained non-immune. In contrast, in the universal immunization programme, which affects the transmission dynamics of rubella virus, immunity of 84-88% of the population is sufficient to prevent outbreaks of rubella (5).

The study revealed that there was a high coverage (93%) among the 11-15 year age group. This has been made possible due to a highly successful school immunization programme carried out in the district. A survey (1983) conducted in South Australia has demonstrated that uptake rates of female rubella immunization were over 80% for 15-24 year olds, in comparison to 36% among 30-34 year olds, reflecting the effectiveness of school programmes (6)

Though the immunization coverage in the 16-44 year age group was above the national target, different immunization rates were observed in different age groups. With the advancement of age, the proportion of non-immunized women increased. Nearly two-thirds of females above 30 years of age in the sample were not-immunized, making them susceptible to rubella when an epidemic occurs. The vaccination of sero-negative women of child

bearing age remains an essential supplemental component even in countries where good universal immunization programmes exist. This is because large pockets of non-immunized children may exist to allow outbreaks to occur. This would expose susceptible pregnant women to infection during outbreaks, despite an apparently adequate overall vaccination compliance rate (5). Thus, it is justified to screen non-immunized women in older age groups who are at risk of giving birth to infants with CRS especially when the programme is selective.

In the study the most frequently reported adverse effect in vaccinated females was low-grade fever (n=20). This symptom has been experienced mainly by a very small proportion of children in other countries. Other reported adverse effects were very low. Studies have shown that rubella vaccine is a cause of acute joint symptoms, without permanent disabilities in adult women. One study revealed that arthralgia occurred in 1-3% of females above 12 years of age. Findings of our study were also within this range (7). It has to be mentioned that these adverse effects were reported as perceived by clients and a cohort group is necessary to determine whether they are due to the vaccination.

Almost all (98%) clients were vaccinated in the pre-conceptional period; and postpartum immunizations were negligible (2%). No client had been immunized during pregnancy nor did they conceive within three months following immunization. Thus it is not a serious problem as was anticipated. If one were to go by the reporting rate of pregnancies within three months following immunization to the epidemiological unit (3.6 per 10000 vaccinations)(8), the expected pregnancies among vaccinated females in the sample is 0.17. The study finding of zero cases is thus compatible with the expected value. Advisory Committee for Immunization Practice in the USA recommended that the ideal period for vaccination was pre-conceptional and postpartum periods. (9). However, postpartum immunization opportunities were under-utilized in the district (1.85%). This has been observed even in the UK. A study showed that out of 183 health districts in England only a few districts offered postpartum rubella vaccinations (10). In contrast, in Los Angeles, 61% of hospitals offering obstetric services had post partum rubella vaccination policies. (11).

Vaccinations were mainly performed in Primary Health Care clinics (58%) and in schools (39%). The government hospitals (1.8%)

and private sector played a minor role in service provision. Occasionally immunization had been performed at work places (0.02%). Organizing vaccination at work places will cover a large group of non-immunized women missed in Primary Health Care clinics.

The majority of women at risk of a pregnancy (88%) in the immediate post vaccination period were using or commenced use of a method of contraception at the time of vaccination. Thus, it has been stated in the literature that in the postpartum period the risk of a pregnancy is low. But this cannot be relied upon and other measures for avoiding a pregnancy should be adopted (12). In the present study, nine clients vaccinated in the post partum period adopted a method of contraception. The commonest method among vaccinated women was Depot Medrol Progesterone Acetate (62%) while Intra uterine device and combined oral contraceptive pill users were relatively low (17%, 18%)..

In conclusion, this study indicates that the overall coverage as well as coverage in the two main target groups was well above the target set by the Department of Health (2). It is recommended that immunization activities be continued in the same manner to reach a coverage of 100% with a view to eliminating CRS. The survey highlighted the success of immunization activities carried out utilizing the school health programme. Family health workers should be advised to look for those who were missed out in the school programme. Efforts are needed to screen non-immunized eligible women and immunize them at family planning and well women's clinics. All pregnant women can be screened at Ante natal clinics for rubella immunization and they can be offered immunization in the postpartum period. The government curative health institutions and the private sector need to be actively involved in immunization against rubella, with more emphasis for post partum vaccinations in curative institutions with obstetric facilities. Finally, a reporting mechanism for Adverse Effects Following Immunization should be implemented for out-door patients and in general practice. The reporting system on Adverse Effects Following Immunization functioning well in Primary Health Care clinics and for in-door patients may be used as the basis of such a system.

Acknowledgements

Deep appreciation and gratitude is extended to Dr. THC Banduthillake for her valuable guidance. The authors would like to gratefully acknowledge the assistance rendered by all Divisional Directors of Health, Public Health Nursing Sisters and Public Health Midwives in Polonnaruwa district. We would also like to extend our sincere gratitude to Mr. Chandrapala, the driver for consenting to travel with us even to terrorist affected areas in the district during the study.

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