

Rubella immunization in a group practice

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THE rubella virus produces some of its more serious results when infection is present during the early stages of pregnancy. The risk of producing congenital abnormalities^{1 2 3} is such that those who contact rubella during the first trimester are usually offered immunoglobulin injection. The effectiveness of this in preventing maternal rubella has been doubted^{4 5} and efforts have been made to perfect ways of conferring active immunity to those at risk. Several live attenuated virus strains have been isolated, of which Cendehill and Wistar produce the least adverse reactions.^{6 7 9 10 11 12 13} Vaccination with these strains has been shown to produce a marked antibody response in 94 per cent of subjects.^{6 7 8 9} The vaccines have not been available for long enough to be certain of the duration of the antibody response; but it is certainly undiminished for at least three years.^{8 14 15}

In the United States and Canada the aim of immunization procedures has been to reduce the pool of wild virus in the community by vaccinating young children.^{7 8 16 17} Because the duration of the protection produced by vaccination is unknown, the British aim is to offer the vaccine to the young adult female.¹⁹ Pregnancy must be avoided for at least three months after vaccination because the teratogenic effects of the vaccine have not been fully established.^{17 18 19 20}

In 1970, the Joint Committee on Vaccination and Immunization recommended that vaccination should be offered to girls in their 11th to 14th year, beginning with the 13-year olds. A letter was sent by the chief medical officer to the Department of Health and Social Security to all general practitioners explaining the rationale of rubella vaccination. The following statement appears in that letter, "Because of the uncertainties of clinical diagnosis a history of previous attack of rubella should not necessarily be regarded as evidence of immunity". The vagueness of this sentence laid the foundation for a misunderstanding which will be mentioned later (Hutchinson⁷). In a Canadian trial it was previously found that 49 per cent of girls who thought that they had had rubella, did not possess antibodies in their blood. The Derbyshire County Education Department distributed a letter from the medical officer of health, to all 13-year-old girls advising them of the need to be vaccinated against rubella. This could be done either by their general practitioner or in a county council clinic, and the parents were asked to return a form indicating their preference.

The aim of the project was to assess the response to their offer of vaccination, by the patients of a Derbyshire group practice; and to compare the response with that of a subsequent offer initiated by the general practitioners.

Method

The practice has an age-sex register, and from this a list of those girls in their 13th year on 10 September 1970 was made. Records were kept of those who attended for

vaccination both at the surgery and also at the county council clinics. As can be seen in table I only some 36 per cent of those at risk initially attended for vaccination.

TABLE I
RESPONSE TO LETTER AND NUMBER VACCINATED

	<i>Percent</i>	<i>Percent</i>
Total number of girls aged 13 years on 1 September 1970: Following medical officer of health's letter:	99	100
Vaccinated in surgery .. 23		
County clinic 6		
School 6		
Total	35	35.8
Total number notified by general practitioner	64 (100)	
Initially vaccinated in surgery .. 47		
Seen by health visitor 17		
Subsequently vaccinated in surgery 9		
Total	56 (87)	56.5
Total vaccinated	91	92.3

The first stage of the general practitioner initiated programme was to utilize a multi-purpose printed card (figure 1) with the relevant extra details filled in, for every child who had not yet been vaccinated. This was posted in a sealed envelope to the parents. Following this letter 73 per cent of those who had not already been vaccinated attended

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DR. J. L. SKINNER DR. E. M. SKINNER DR. P. J. ENOCH DR. M. A. VARNAM	LITTLE WICK NOTTINGHAM ROAD ILKESTON DE7 5PR
Dear _____	
_____ is/are due for _____ at the	_____ at _____ a.m./p.m. If inconvenient
surgery on _____ at _____ a.m./p.m. If inconvenient	
please call or phone.	
Yours sincerely,	

Figure 1

the surgery, most of them at one session. The local authority health visitor, directly attached to the practice, then visited the homes of the remainder to explain the advantages of immunization. The health visitor demonstrated one of the inaccuracies of the age-sex register in that seven out of the 17 girls she visited no longer lived at the recorded address. This accords with the suggestion that in age-sex registers established from executive council card index files there are inaccuracies of some 10-14 per cent,²¹ owing to changes of address or to a change of practitioner. Following an approach to

the executive council, the health visitor visited five families who had notified the council of a change of address. This programme demonstrates again the need for regular updating of the age-sex register.

The reported reactions following Cendehill vaccination range from a mild erythema at the site of injection to severe systemic disturbances.^{6 19 10 13} The reported incidence of such reactions has varied even more than the reactions themselves. Ingalls¹¹ finding a two per cent reaction rate, whilst MacDONALD²¹ studying an adult group of vaccinees describes various symptoms developing in 53 per cent of those vaccinated. At the time of vaccination, the subjects described in this paper were advised that a mild constitutional disturbance might follow the injection. In only one case was the reaction considered serious enough by the vaccinee for her to seek medical advice; and this was with a possibly coincidental urticaria.

The result of the procedure described was that 92 per cent (plus or minus the inaccuracy of the age-sex register) of the 13-year-old girls in the practice were vaccinated against rubella.

TABLE II
THE COST OF THE PROGRAMME

	EXPENDITURE	Hours	Cost
Secretarial ..	Finding those at risk from age-sex register	1·00	
	Checking addresses	1·00	
	Addressing cards to patients	0·45	
	Time spent on administration on day of vaccination ..	2·00	
	Filling in form EC73	1·00	
	Total	5·45	2·00
Practice manager ..		1·30	1·00
Health visitor ..		2·00	1·20
Postage			2·45
Printed cards ..			0·75
	Total		£7·40
INCOME			
	56 vaccinations at 45p		£25·20

Discussion

Hutchinson⁷ describes a Canadian vaccination programme, in which parents were sent a letter inviting their children (age 5-13) for measurement of their rubella antibody level: 81 per cent consented, and of these 79 per cent proved seronegative and were vaccinated. Gooch²³ however dealing with an American military camp population of 10,000 families, and using the more expensive and less personal techniques of radio and press advertising, reports an acceptance rate of only four per cent. The initial response to the letter received from the medical officer of health in this survey was 36 per cent and thus it compares badly with Hutchinson's results and well with Gooch's. The final acceptance rate of 92 per cent in this smaller scale programme compares well with the results obtained by both Hutchinson and Gooch.

The initial letter from the county medical officer was given to the girls at school.

This is certainly the cheapest way of distributing the letters, but some doubt must be cast on how many of these letters reached the parents.

The published evidence suggests that many of those who give a history of having had rubella do not possess a positive antibody level.⁷ The only way of determining those who needed the vaccine would be to measure the antibody titres of all the girls at risk. If this is not done then all those at risk should be vaccinated regardless of clinical history.^{18 19 24} The letter from the Department of Health and Social Security was rather vague on this point and as a result those parents receiving the circular from the county medical officer of health who thought their children had had rubella may have decided not to accept vaccination of them. Following the practice letter several parents telephoned with this query, and they were advised that all should be vaccinated.

This confusion may be one of the reasons for the poor initial response (36 per cent) and it is postulated that the more direct communication from the patient's general practitioner, with whom there is a close personal relationship, was responsible for the markedly increased response received (73 per cent of the remainder). The further follow-up from the attached health visitor, with her "face to face" advice was another helpful factor. As a result immunization of 87 per cent of those who initially did not respond was achieved.

The discussion so far has been confined to the methods employed in this immunization scheme. An attempt will now be made to quantify its cost effectiveness.

The administrative costs of the letter from the county health department to the girls are difficult to quantify and are not great as the letter was produced and distributed with other school correspondence.²⁵ All the vaccine used following the county health department initiated letter and as a result of the general practitioner scheme was purchased by the county health department, and so the one dose cost of 66p was the same for both. It can therefore be said that notification of the need for immunization via the county health department to the children at school is cheap, but not very effective in terms of response (35 per cent).

The costs incurred by the general practitioner have been estimated according to the extra time spent by each member of the team, on the practitioner initiated recall scheme (table II). This estimate cannot be precise for it is not always easy to cost a person's value in terms of money. For this reason, only the time spent by non-medical staff has been costed.

Against this extra cost must be set the extra income received by the practice. For every vaccination performed in accordance with national policy and notified to the executive council on an EC73 form, an item of service fee is payable. It is interesting to note that Saunders²⁶ records the time spent on filling in a form EC73 as 2.5 minutes per form, and 1.5p as the cost to the executive council of processing it. Both these estimates appear to be high, and form filling in this practice certainly takes less time.

Table I shows the response and table II the cost of the two programmes. It will be seen that an increase in the acceptance rate from 36 per cent to 92 per cent was achieved, together with a return on the extra expense incurred by the practice of over 300 per cent.

Galloway²⁷ described in 1963 the West Sussex immunization scheme which uses a computer. The records of all children and their immunization state are stored in a computer. At monthly intervals those who are due for a particular vaccination, are notified either directly or via the general practitioner (depending upon the wishes of the latter) Saunders²⁶ published comparisons of both the cost and effectiveness of this scheme as compared with the England and Wales averages. He showed that the acceptance rate of vaccination in West Sussex during 1968 exceeded those of England and Wales by between 16 and 47 per cent (depending on type of vaccination). Saunders²⁶ also demonstrated that the unit cost per procedure during 1968 was 17.5p in West Sussex and 27.5p

in England and Wales. These figures include the high cost of setting up a computer based system.

It is fair to say that a computer based immunization scheme is cost effective. However until all immunization is based on such a system it is believed that this general practitioner scheme, using an age-sex register, which is administratively simple to operate, produces an adequate financial return. It results in a high rate of acceptance and is a cost effective method of implementing government policy.

This scheme is equally applicable to the recently recommended re-vaccination of the 15-19-year olds against polio and tetanus and also to the remainder of 11-14-year olds due for rubella immunization.

Summary

A procedure is described by which a group practice initiated a recall system for those 13-year old girls in the practice who had not been vaccinated against rubella. An acceptance rate of 92 per cent was achieved compared with a rate of 36 per cent following distribution of an invitation for the same immunization from the county medical officer of health.

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