An assessment of the implementation of the pneumococcal conjugate vaccination program for Aboriginal and Torres Strait infants in North Queensland

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Abstract

A cohort of 199 Aboriginal and Torres Strait Islander infants, born in north Queensland in August and September 2002, were followed-up to ascertain the uptake of the 7-valent pneumococcal conjugate vaccine (7vPCV) by certain ages. Although 70 per cent of the cohort had received a dose of 7vPCV by three months, only 50 per cent had received three doses by seven months. Most (approximately 90%) of the children who received the vaccine by three and five months were given it at the same time as the other two scheduled injectable vaccines, and most (84%) of the children received three doses of 7vPCV by 12 months of age. However, 18 per cent of the cohort had not received any vaccines (other than those given at birth), another 10 per cent had received the other scheduled vaccines but no 7vPCV by three months of age, and 38 per cent had received the other vaccines but not two doses of 7vPCV by five months. A variety of measures are described that have been put in place to attain optimal coverage of Aboriginal and Torres Strait Islander infants in north Queensland with 7vPCV and to improve timeliness. *Commun Dis Intell* 2003;27:262–266.

Keywords: pneumococcal conjugate vaccinate, surveillance, vaccination, pneumonia

Introduction

The licensure of the 7-valent pneumococcal conjugate vaccine (7vPCV; Prevenar®) in Australia in early 2001 provided a means to prevent much of the pneumonia and perhaps some of the otitis media affecting young Aboriginal and Torres Strait Islander children. Draft recommendations on the use of 7vPCV in a National Childhood Pneumococcal Vaccination Program[1] gave priority to Aboriginal and Torres Strait Islander children as the main target population for the Program in recognition of the high burden of invasive pneumococcal disease in these children. The Commonwealth provided funding for the Program's vaccines, in particular 7vPCV, and Aboriginal infants in the Northern Territory began to receive 7vPCV in early June 2001.[2]

Because 7vPCV was not only a completely new vaccine, but also a very expensive one, a decision was made to roll-out the vaccine methodically in north Queensland over several months. Before any 7vPCV was distributed to a vaccine service provider, that provider had to attend a specific training session delivered by Tropical Public Health Unit (TPHU) staff, and had to be conversant with all aspects of 7vPCV including transportation, storage and administration. To support the training, an interim Standing Drug Order for the vaccine was prepared and distributed so that endorsed registered nurses could participate in the delivery of the vaccine. Various other provider and parent resources were also developed; the roll-out of 7vPCV took place in north Queensland from July to September 2001.

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This report details an assessment of the roll-out that was undertaken by determining the uptake of 7vPCV in a defined cohort of Aboriginal and Torres Strait Islander infants. The specific objectives were to determine:

- the percentages of the cohort that had received 7vPCV by three, five and seven months of age, as recommended;[1]
- the percentages of those children who were vaccinated with 7vPCV by three and five months of age that had also received the other two recommended injectable vaccines (i.e. DTPa-hepB and Hib) at the same time;
- the percentage of the cohort that had received three doses of 7vPCV by 12 months of age; and
- the percentages of the children attending each category of vaccine service provider that had received the vaccine by three, five and seven months of age.

Methods

All Aboriginal and Torres Strait Islander births that took place in August and September 2001 in four major public obstetric units in north Queensland were identified from hospital separation data held at the hospitals (Table 1). The uptake of a first dose of 7vPCV by three months of age was determined using the statewide computerised immunisation register, Vaccination Information and Vaccination Administration System (VIVAS).[3] Similarly, the uptake of the second and third doses (separated from the previous dose by at least a month) by five and seven months of age, respectively, were determined. The information on VIVAS also indicated whether the vaccine had been administered at the same time as the other two recommended vaccines.

The various vaccine service providers who had provided vaccines to the children in the cohort were categorised as 'community health/Royal Flying Doctor Service (RFDS)' (the latter provides much of the child health services in remote settings in north Queensland), 'Aboriginal and Torres Strait Islander health services', 'general practices' and 'other' (mainly hospitals that opportunistically vaccinate children). The percentages of the cohort children who had been given 7VPCV by each category of provider by three, five and seven months were determined.

If any child in the cohort had apparently not received 7vPCV by three months of age, the primary health care provider of the mother was contacted, where possible, to determine whether the vaccine had in fact been given. Similarly, if any child had apparently not received the vaccine by five (or seven) months of age, the vaccine provider who administered the vaccines by three (or five) months of age was contacted.

The details of any child in the cohort who had not received any vaccines (apart from the vaccines given at birth) by three months of age, and who did not appear to have a designated vaccine service provider, were forwarded to the local Community Health services for follow-up. Where possible, these services undertook catch-up vaccination with all overdue vaccines.

Results

The cohort consisted of 199 infants at three months of age (Table 1), but because two of the infants died (one from pertussis) before reaching five months, the cohort consisted of 197 children thereafter.

Although 70 per cent of the cohort had received a dose of 7vPCV by three months, only 50 per cent had received three doses by seven months (Table 2). Of the 60 children who had not received a dose of 7vPCV by three months, 36 (60%) had not received any vaccines other than those given at birth, and another 20 (33%) had received the other scheduled vaccines (i.e. DTPa-hepB, Hib and OPV) by three months. Of the 139 children who had received a dose of 7vPCV by three months, 127 (91%) had received it at the same time as the other two injectable vaccines.

Of the 78 children who had not received a second dose of 7vPCV by five months of age, two (3%) had not received any vaccines other than those given at birth, and 18 (23%) had received the other scheduled vaccines by five months of age but no 7vPCV. Another 57 (73%) had received the other scheduled vaccines but had received only one dose of 7vPCV by five months of age. Of the 119 children who had received two doses of 7vPCV by five months, 110 (92%) had received the second dose at the same time as the other two injectable vaccines.

Of the 99 children who had not received a third dose of 7vPCV by seven months of age, 60 (61%) had received only two doses, 28 (28%) had received only one dose, and 11 (11%) had not received any doses, respectively, by this age. Altogether, 166 (84%) of the cohort (197 children) received three doses of 7vPCV by 12 months of age; another 19 (10%) received two doses by 12 months.

With the exception of those who attended general practices, the percentage of children who were given 7vPCV by each category of vaccine service provider declined at each successive age milestone (Table 3). However, of those Aboriginal and Torres Strait Islander infants who consulted general practitioners, only about a quarter were given 7vPCV at each age milestone.

Table 1. Aboriginal and Torres Strait Islander births used for the assessment of the roll-out of 7vPCV in north Queensland (birth cohort August and September 2001)

Hospital	Aboriginal and Torres Strait Islander births	
	n	%
Cairns Base	90	45
Kirwan Womens (Townsville)	53	27
Thursday Island	29	15
Mt Isa Base	27	13
Total	**199**	**100**

Table 2. The number and percentage of the cohort children given the appropriate number of doses of 7vPCV, by each successive age

Outcome	First dose by 3 months		Two doses by 5 months		Three doses by 7 months	
	n	%	n	%	n	%
Vaccinated appropriately	139	70	119	60	98	50
Not vaccinated appropriately	60	30	78	40	99	50
Total	**199**	**100**	**197**	**100**	**197**	**100**

Table 3. The number and percentage of the total number of children given 7vPCV, by vaccine service provider category and vaccination age

Vaccine service provider category	First dose by 3 months		Two doses by 5 months		Three doses by 7 months	
	n/N	%	n/N	%	n/N	%
Community health/ RFDS	99/115	86	92/132	70	77/134	57
ATSIHS	26/30	87	22/35	63	16/34	47
General practice	6/22	27	5/20	25	5/19	26
Other	8/11	73	0/7	0	0/9	0
Total	**139/178**	**78**	**119/194**	**61**	**98/196**	**50**

n Number.

N Total number.

RFDS = Royal Flying Doctor Service; ATSIHS = Aboriginal and Torres Strait Island Health Service

Discussion

This assessment has revealed several encouraging outcomes. Most (70%) of the children received the first dose of 7vPCV by three months, most (approximately 90%) of the children who received the vaccine by three and five months were given it simultaneously with the other two scheduled injectable vaccines, and most (84%) of the children received three doses of 7vPCV by 12 months of age.

However, the assessment had also revealed several problems. Firstly, it is a concern that 18 per cent (36 children) of the cohort had not received any vaccines, other than those given at birth, by three months of age. Children who are late in starting their vaccinations are at high risk of not completing the recommended standard vaccination schedule by two years of age.[4]

Secondly, it is worrying that 20 children (10% of the cohort) had received the other scheduled vaccines but no 7vPCV by three months of age, and that 75 (38% of the cohort) had received other scheduled vaccines but not two doses of 7vPCV by five months. There are several possible reasons for this, but probably the most important overall is a reluctance to administer three injectable vaccines simultaneously. A consequence of not administering 7vPCV at the same time as the other two vaccines is a considerable risk that the child may not return for the 7vPCV; this is particularly likely if the child comes from a highly mobile and hard-to-reach population, such as some Aboriginal and Torres Strait Islander children.

It appears that in general, vaccine service providers have more concerns about administering multiple injectable vaccines simultaneously to children than parents do.[5,6] This has considerable implications because vaccine service providers' attitudes towards immunisation are powerful determinants of parental decision making about vaccination for their children. Nevertheless, if vaccine service providers can be convinced that multiple vaccinations are safe and effective, their concerns can be overcome and they can administer three (and even four) injectable vaccines simultaneously in a way that appears to be quite acceptable to parents.[7,8]

Thirdly, the poor uptake in those children who attended GPs is an on-going concern. There are two possible reasons for this problem. Because of the cost of the vaccine, it is not possible to have 7vPCV in stock in every general practice in Queensland and therefore GPs may not have had the vaccine available to administer to Aboriginal and Torres Strait Islander children at the same time as the other scheduled vaccines. (This would have contributed to the failure to deliver 7vPCV simultaneously, as outlined above, particularly by three months of age.) Since this assessment, those GPs who regularly see Aboriginal and Torres Strait Islander patients, and those who have already initiated a 7vPCV series, have received doses of 7vPCV as stock-in-hand.

However, a greater problem is that many GPs apparently did not ascertain whether a child is of Aboriginal and Torres Strait Islander descent, and therefore could not identify whether the child was eligible for funded 7vPCV. This problem is openly acknowledged by some GPs, and the Queensland Divisions of General Practice have offered to assist GPs to ask about a child's Indigenous status. Meanwhile, the Personal Health Record given to each mother of a newborn Aboriginal and Torres Strait Islander infant in north Queensland has been modified to indicate that the infant is of Aboriginal and Torres Strait Islander descent. The modified Personal Health Record indicates that the infant is eligible for 7vPCV as well as other recommended childhood vaccines.

The decline in the uptake of 7vPCV with each successive dose in the children who attended Community Health/RFDS vaccine service providers is probably an artefact. This is because the Community Health services were given the particular responsibility of following-up the children who had not received 7vPCV. Therefore the Community Health/RFDS vaccine service providers were given 17 extra children between who were late in starting their vaccinations, and they would have been very difficult to vaccinate appropriately by age.

Nevertheless, the decline in uptake with each successive milestone age in the children who attended the other vaccine service providers is of concern. Although only approximately 17 per cent of the cohort attended the five Aboriginal and Torres Strait Island Health Services in north Queensland, the uptake of 7vPCV in these children fell from 87 per cent by three months to 47 per cent by five months of age. Similarly, none of the approximately eight Aboriginal and Torres Strait Islander children opportunistically vaccinated in hospitals in north Queensland by five and seven months of age received 7vPCV.

The importance of 7vPCV for Aboriginal and Torres Strait Islander children has been reported in a recent edition of the TPHU newsletter, and TPHU staff have emphasised it in in-service training of practice staff and Aboriginal and Torres Strait Islander Health Workers.

Although most Aboriginal and Torres Strait Islander infants ultimately receive three doses of 7vPCV, for too many it is given late. This problem must be corrected; not only does severe pneumococcal disease, in particular pneumococcal meningitis, occur at a much earlier age in Aboriginal and Torres Strait Islander children,[9] but otitis media also begins very early in life in these infants.[10]

Acknowledgments

Many people assisted with either the roll-out of the vaccine or in the assessment. We particularly wish to thank Susan Hills, Penny Ford, Narelle Hamilton, Fiona Tulip and Brad McCulloch.

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