Uptake and Behavioural and Attitudinal Determinants of Immunization in an Expanded Routine Infant Hepatitis B Vaccination Program in British Columbia

M. Bigham, MD, MHSc¹
V.P. Remple, RN, PhD(Cand.)²
K. Pielak, MSN²

C. McIntyre, BScN²
R. White, MSc²
W. Wu, BSc²

ABSTRACT

Introduction: British Columbia (BC) implemented a universal infant hepatitis B (HB) immunization program in 2001. The study objective was to evaluate HB immunization coverage among the first six-month cohort of eligible infants in the province outside of the Vancouver-Richmond health region and to assess parent/guardian behavioural and attitudinal determinants of HB immunization.

Methods: A cross-sectional survey of HB immunization was conducted using a random sample of eligible infants born between 1 January-30 June 2001. HB immunization coverage data were obtained from the provincial Public Health Information System, and through a telephone survey of 487 of eligible infants' parents/guardians that was conducted between October 2002-January 2003. At this time, parents/guardians were also asked about behaviours and attitudes towards immunization, based on the Immunization Health Belief Model Scale.

Results: HB immunization coverage with at least one dose of HB vaccine was 89% and uptake of 3 doses of HB vaccine was 78%. HB immunization was significantly associated ($p < 0.001$) with a recommendation for HB immunization from a health care professional. The main reason for non-HB immunization was parental concern about side effects.

Discussion: Seventy-eight percent of infants completed the 3-dose HB vaccination schedule. Parental behaviour regarding HB immunization of their children was strongly influenced by a supportive recommendation from either a nurse or doctor.

MeSH terms: Hepatitis B; immunization; program evaluation; health behavior

La traduction du résumé se trouve à la fin de l'article.

1. Department of Health Care and Epidemiology, University of British Columbia, Vancouver, BC

2. British Columbia Centre for Disease Control, Vancouver

Correspondence: Dr. Mark Bigham, Canadian Blood Services, BC & Yukon Blood Centre, 4750 Oak Street, Vancouver, BC V6H 2N9, Tel: 604-707-3505, Fax: 604-875-8004, E-mail: mark.bigham@bloodservices.ca

Acknowledgements: Karen Jacobsen, Theresa Fuller, and the research team of Westcoast Clinical Research, Inc. for conducting telephone interviews, and Lisan Kwindt, BC Centre for Disease Control, for data entry.

Source of support: This study was sponsored by an unrestricted grant-in-aid from Merck-Frosst Canada Ltd.

The World Health Organization, U.S. Advisory Committee on Immunization Practices and Canada's National Advisory Committee on Immunization (NACI) recommend universal childhood hepatitis B (HB) immunization as a highly cost-effective and efficient prevention strategy.¹⁻⁷ British Columbia (BC) introduced a grade 6 HB immunization program in 1992, achieving an average 92% uptake of 3 doses in each of the first 6 years of the program and effectively eliminating HB infection among successive grade 6 cohorts.⁸⁻¹⁰ Nevertheless, over this same time period, an estimated 30 to 100 cases of acute HB continued to occur each year in the province, affecting children younger than grade 6 age (BC Centre for Disease Control, 1998: unpublished report).

The Vancouver-Richmond Health Board provided funding to enable an infant HB immunization program to be implemented in that region in 1998, offering hepatitis B vaccine at 2, 4, and 6 months of age and achieving 74% uptake of 3 doses in the first year of the program.¹¹ The BC Ministry of Health extended a similar infant HB immunization program to the rest of the province for infants born after 1 January 2001, with the aim of eliminating childhood hepatitis B infection in the province.^{10,12} This new program more than doubled the proportion of Canadian infants for whom routine publicly funded HB immunization was offered, increasing from approximately 6% (i.e., infant HB immunization programs in New Brunswick, Prince Edward Island, Yukon, Northwest Territories, Nunavut and Vancouver-Richmond region) to 15% of Canadian infants under one year of age.^{13,14}

The objectives of this study were to evaluate HB immunization coverage among the first six-month cohort of eligible infants in the province outside of the Vancouver-Richmond health region and to assess parent/guardian behavioural and attitudinal determinants of HB immunization.

METHODS

HB immunization coverage and determinants of HB immunization were evaluated in a cross-sectional study, approved by the University of British Columbia

Behavioural Research Ethics Board. A cohort of 17,368 British Columbia children born between 1 January and 30 June 2001 was identified from the provincial electronic Public Health Information System (PHIS). PHIS incorporates a provincial immunization registry for public health-administered vaccinations outside of the Vancouver-Richmond health region, capturing about 60% of all childhood immunizations in BC. Almost all childhood immunizations in the Vancouver-Richmond health region are physician-administered, which are not captured in the Public Health Information System (PHIS). Immunization data recorded in PHIS routinely include: vaccine product(s) administered, vaccine lot number, date of administration, dose, route of administration, injection site, and provider.

The PHIS immunization registry was gradually implemented by health regions across BC during 2000 and 2001. Data were collected between October 2002 and January 2003, at which time the cohort of interest ranged in age between 15 months and 2 years old. Due to incomplete childhood immunization data capture in PHIS over the study period, and to evaluate determinants of HB immunization, telephone interviews were also conducted with parents from a random sample of children with and without a record of at least one HB immunization in PHIS.

To assess recall bias among parents of children with no PHIS record of HB immunization, 25 randomly selected parents (approximately 5% of the total sample interviewed by telephone) had their self-reported immunization history verified against records maintained by their immunization providers. There was 100% agreement between parental report and health records.

Based on previous provincial surveys of immunization uptake among 2 year olds,¹⁰ we hypothesized that 90% of infants received at least one dose of HB immunization, and extrapolated that a similar proportion of parents had favourable attitudes towards surveyed indicators of infant HBV vaccination. A sample size of 385 infants was required to obtain 90% power to measure these outcomes with a 95% confidence interval width of 3%. To test the hypothesis that parents of unimmunized infants have less favourable attitudes

Figure 1. Sampling selection

- 1 Determined from live births in BC minus live births in Vancouver and Richmond (Division of Vital Statistics, BC Ministry of Health Planning)
- 2 Reported in PHIS for one or more public health interventions, excluding immunization
- 3 The initial 100 households that were sampled and surveyed to determine PHIS immunization coverage accuracy were retained in the final data analyses
- 4 Reasons not interviewed: not interested (45%), language barrier (27%), no time (8%), other (20%)

towards immunization than those of immunized infants, given 385 immunized infants, a sample size of 54 unvaccinated infants was calculated to provide 80% power to detect a 15% difference with $\alpha=0.05$ (SPSS[®] 6).

The unique sampling strategy employed (Figure 1) was intended to address varying immunization data entry in PHIS that existed between health regions and over the study time period, during the transition from paper-based to electronic immunization record keeping in BC. We chose one dose of HB vaccine as the threshold for dichotomizing HB immunization sta-

tus based on an empiric assumption that there would be a greater measurable difference in immunization determinants between infants with zero versus 1 dose of HB vaccine, than for example between infants with 2 versus 3 doses of HB vaccine.

A pilot telephone survey of 100 randomly selected households of infants with no record of HB immunization was done to estimate the degree of accuracy of PHIS in capturing HB immunization coverage. Thirty-seven of 48 (77%) respondents reported that their child had received 3 doses of HB vaccine. Based on this, we

TABLE I
Demographic Characteristics of HB-immunized and HB-unimmunized Infants and Parent/Guardian Respondents

	HB-immunized (n=433)		HB-unimmunized (n=50)		p-value*
	No.	(%)	No.	(%)	
Gender of Child					
Male	208	(48)	24	(48)	1.00
Female	223	(52)	26	(52)	
Missing	2	(0)	0	(0)	
Family Structure					
Married/common law	404	(93)	45	(90)	0.52
Single	25	(6)	4	(8)	
Missing	4	(1)	1	(2)	
Residence Location					
Urban	337	(78)	38	(76)	0.98
Rural	79	(18)	9	(18)	
Missing	17	(2)	3	(6)	
Respondent Education					
< High school	34	(8)	4	(8)	0.41
High school	76	(18)	5	(10)	
Post-secondary	312	(72)	40	(80)	
Missing	11	(2)	1	(2)	
Respondent Race					
Caucasian	352	(82)	42	(84)	0.008
Asian	60	(14)	2	(4)	
Aboriginal	9	(2)	2	(4)	
Other	6	(1.5)	4	(8)	
Missing	6	(1.5)	0	(0)	
Age Range of Respondent					
<20	4	(1)	0	(0)	0.59
20-24	29	(7)	1	(2)	
25-29	100	(23)	14	(28)	
30-34	154	(36)	19	(38)	
35+	141	(32)	15	(30)	
Missing	5	(1)	1	(2)	
Gross Household Income					
<\$10K	10	(2)	0	(0)	0.06
\$10-29.9K	39	(9)	10	(20)	
\$30-49.9K	100	(23)	12	(24)	
\$50K+	180	(42)	16	(32)	
Missing	104	(24)	12	(24)	

* Comparison between HB and no HB groups, excluding missing data

TABLE II
Immunization Characteristics of Sample of HB-immunized and HB-unimmunized Infants and Parent/Guardian Respondents

	HB-immunized (n=433)		HB-unimmunized (n=50)		p-value*
	No.	(%)	No.	(%)	
Aware of HB Immunization Program					
Yes	335	(77)	35	(70)	0.29
No	98	(23)	15	(30)	
Source of Information (n=370)					
Public Health Nurse	171	(51)	17	(48)	0.10
Physician	88	(26)	8	(23)	
Public Health Pamphlet	41	(12)	2	(6)	
Other	33	(10)	8	(23)	
Missing	2	(1)	0	(0)	
Does Child Have Any Other Immunizations					
Yes	431	(99.5)	30	(60)	<0.001
No	0	(0)	18	(36)	
Unsure	2	(0.5)	2	(4)	
HB Immunization Provider (n=433)					
Health Unit	270	(62)			
Family physician	154	(36)			
Pediatrician	4	(1)			
Hospital	3	(1)			
Missing	2	(0)			
Reasons for No HB Immunization (n=50)					
Parental concern re side effects			12	(24)	
Parental deferral to older age			11	(22)	
Parental perception that child not at risk			5	(10)	
Parent unaware of program			3	(6)	
Other			19	(38)	

* Comparison between HB-immunized and HB-unimmunized groups, excluding missing data.

continued sampling from this group for the remainder of the telephone survey, with the exception of a sub-analysis of 75 randomly selected infants who did have a PHIS record of HB immunization to determine if any systematic demographic differences between the 2 groups could be detected. Introductory (English language) letters were mailed to randomly selected households, and trained research assistants and nurses followed up with as many as eight telephone attempts, at varying times of day and week, to make contact. Surveys were conducted in English only.

A questionnaire, tested for content validity by expert panel,¹⁵ was used to elicit information related to demographics, prior knowledge of HB program, sources of program information, parental-reported HB immunization status (of child), number of doses, immunization provider, reasons for non-immunization, other immunization coverage (of child), and health behaviour concepts. Health behaviour and attitudes were measured using the Immunization Health Belief Model (IHBM) Scale, for which test validity and reliability characteristics have been previously described.¹⁶ An overall Cronbach alpha coefficient of 0.63 was reported for the IHBM Scale, reflecting moderate internal consistency.¹⁶

All analyses were conducted using Splus® 6 for Windows except for exact p-values which were calculated using StatXact®. Stepwise logistic regression was used to model explanatory variables for HB immunization and odds ratios (OR) were calculated for the most important predictors of HB immunization. Association between HB immunization and other variables was examined using cross-tabulation, Chi-square, Fisher's exact, and t-tests.

RESULTS

Of 968 mailouts, household contact was made with 597 (61%); of these, 487 (82%) participated in the survey (overall participation rate 50.3%). Among parents/guardians interviewed, 433 of 487 (88.9%, 95% confidence interval: 85.8%, 91.4%) reported that their child had received at least one HB vaccination. Of these, 381 (87.9%) were either documented in PHIS and/or reported by parents/guardians to have received 3 doses of HB vaccine. Overall, of 487 parents

TABLE III

Percentages of Respondents Answering “Strongly Agree” or “Agree” to Health Behaviour Conceptual Questions, Stratified by HB Immunization Status of Child

Concepts (Immunization Health Belief Model Scale)	HB-immunized (n=433) %	HB-unimmunized (n=50) %	p-value*
Perceived Susceptibility			
1. My child is at high risk for hepatitis B (HB)	5	2	0.49
2. I think my child will get HB in future	3	6	0.17
Perceived Disease Severity			
1. HB is a serious disease	95	92	0.51
2. My child could be very sick if s/he got HB	85	86	1.00
3. I am afraid to even think about my child getting sick with HB	76	50	<0.001
Prior Contact			
1. A friend/relative was sick with HB	6	0	0.16
2. I know someone who has had HB	13	14	1.00
Knowledge			
1. I feel I am knowledgeable about HB	43	52	0.29
Cues to Action			
1. My spouse wanted my child to get HB vaccine	54	6	<0.001
2. My family members wanted my child to get HB vaccine	31	2	<0.001
3. A nurse recommended HB vaccine for my child	51	18	<0.001
4. My doctor recommended HB vaccine for my child	53	8	<0.001
5. Most of my friends/family's babies have had HB vaccine	58	10	<0.001
Perceived Barriers			
1. The HB shot can be painful	49	38	0.18
2. Watching my child get needles frightens me	22	24	0.86
3. The HB vaccine is not safe	1	12	<0.001
4. It is convenient to take my child in for vaccines	94	80	0.003
Perceived Benefits			
1. Immunization will prevent HB	82	36	<0.001
2. By getting HB vaccine, my child will not spread HB to others	68	38	<0.001
3. Getting HB vaccine will not prevent my child from getting HB	13	24	0.031
Motivation			
1. I take my child to the doctor for regular check ups	81	68	0.043
2. I feel it is important to do things to improve my child's health	100	100	1.00
3. I want to discover or prevent health problems early	100	100	1.00
4. I search for new information to improve my child's health	86	94	0.13

* Comparison between HB-immunized and HB-unimmunized groups, excluding missing data.

interviewed, 78.2% of infants had received 3 doses of HB vaccine. Ninety-eight percent of HB vaccinees received HB vaccine at the same time as their Pentacel™ vaccine (data not shown).

As depicted in Table I, demographic characteristics of HB-immunized and HB-unimmunized infants and their parents/guardians were similar. Awareness of the HB immunization program was equally high in both groups (Table II). HB-immunized children were much more likely to have other immunizations than those who were not HB-immunized (99.5% vs. 60%, $p<0.001$).

Results of responses to the 24 health behaviour questions are summarized in Table III. Of the 50 children who were not immunized, the main reason cited by parents/guardians was concern about side effects, followed by parental deferral to older age and parental perception that their child was not at risk. Eleven (2.3% of total sample) identified themselves as ‘conscientious objectors’ to immunization (data not shown).

Mean scores on the eight Health Belief Model concepts are summarized in

Figure 2. Parents of immunized children had a statistically significant higher perception of HB disease severity (mean score 3.97 vs. 3.71, $p<0.05$), more cues to action (3.26 vs. 2.40, $p<0.05$), lower perceived barriers (2.42 vs. 2.66, $p<0.05$), and perceived greater benefits (3.69 vs. 3.21, $p<0.05$) to immunization.

Table IV summarizes results of the logistic regression model. When adjusted for all other model variables, there was a 12-fold increase in the odds of HB immunization for a 1-unit increase in “cues to action” mean score ($p<0.001$).

DISCUSSION

Overall, 89% of our sample of infants received at least one dose of HB vaccine while uptake for a complete 3-dose series of HB vaccine was 78%, based on PHIS and parental-reported immunization. Coverage for 3 doses of HB vaccine is comparable to published coverage rates among 2-year-old children in BC for diphtheria-tetanus-pertussis-containing vaccines (averaging 82% between 1995-1998) that are also administered as a 3-dose series

in the first 6 months of life.¹⁰ Since the pre-adolescent HB immunization program in BC for grade 6 students is scheduled to continue only until the first cohort of HB-immunized children enters grade 6, consideration should be given by public health officials to continue reviewing and updating HB vaccinations at that grade level to catch-up children who were not vaccinated through the infant program.

There are several factors affecting the reliability of our estimate of HB vaccine coverage. Data on physician-administered HB vaccine were not included in our analysis. In BC, where approximately 40% of childhood vaccinations are delivered by physicians, this also poses a major challenge to monitor progress towards meeting the national standards for immunization coverage recommended by the Canadian Immunization Registry Network.¹⁷ However, a 1999 parent telephone survey of HB vaccine uptake among a one-month cohort of infants in the Vancouver-Richmond health region,¹¹ where physician-administrated childhood immunization predominates, reported that by eight months of age, 73.8% of infants had

Figure 2. Mean scores* of health behaviour concepts between parents of HB-immunized and HB-unimmunized children

* Response options for each item within a concept were on a 5-point Likert scale. For each concept, summed item scores were averaged to provide a total concept score ranging from 1-5.

† Statistically significant at $p < 0.05$

TABLE IV

Results of Logistic Regression* – Factors Associated with Infant HB Immunization

	Coefficient	SE†	Odds Ratio	95% CI	p-value‡
Any other immunizations? Yes/No	–	–	–	–	<0.001
Cues to action	2.63	0.45	13.9	5.7, 33.5	<0.001
Perceived benefits	0.53	0.39	1.7	0.8, 3.7	NS
Perceived barriers	-0.49	0.5	0.6	0.2, 1.6	NS
Severity	0.18	0.44	1.2	0.5, 2.8	NS

* Response variable: HB immunization

† SE – standard error

‡ Based on Wald statistics

– An odds ratio cannot be calculated due to the fact that ALL children with HB immunization reported having other immunizations.

received 3 HB vaccine doses, and 12.6% had received 2 doses. Our findings are in line with this survey, as well as previous comparisons of vaccine program effectiveness in BC between public health and physician immunization program delivery.^{18,19}

This study represented the first attempt to utilize the PHIS immunization registry as a sampling frame for evaluating an immunization program in BC. The sampling strategy was intended to manage incomplete reporting of childhood immunizations in PHIS during its implementation period. In addition, the more prolonged (4-month) period of data collection resulted in a wider range of cohort age over the sampling period than conventionally used to estimate infant vaccine coverage. For example, National Immunization Coverage Surveys in Canada in 2002 and 2004 found that 9 Canadian jurisdictions assessed childhood vaccine uptake for 2 year olds (at or by the second birthday).^{17,20} Language barrier has been cited as a significant potential barrier to immunization,²¹ and we found that inability to understand

English was the cause of refusal for interview in 28 of 104 refusals for interview (27%), or 6% of all interviews conducted.

Parents perceive public health nurses and physicians as the major sources of immunization-related information. Their role in influencing parents' health-related behaviours, such as infant immunization, may be particularly important in the context of "cue to action" (the triggering force that compels a person to take action), which emerged as an important predictor of infant immunization in our analysis. One of the cues to action that we found to be significantly associated with reported HB immunization of infants was a supportive recommendation from either a nurse or the parents' doctor, consistent with other studies.^{22,23} Attention to parents' vaccine-related safety concerns such as mercury exposure through HB immunization may enhance parents' confidence.²⁴ To help minimize these concerns, BC offers thimerosal-free formats of hepatitis B vaccine in its infant programs. Our study also did not identify multiple vaccine injections at a single clinic visit to

be an impediment to HB immunization.^{20,25}

Since immunization is voluntary in Canada,³ and at a time when anti-immunization proponents challenge health care providers,^{26,27} and parents seek to exercise varying degrees of control and decision-making responsibility for their children's health,²⁸ ongoing attention to parents' behavioural and attitudinal determinants of immunization is especially relevant. Attentive and appropriate communication about immunization by health professionals to parents of young children may positively address parental concerns that stimulate action in support of infant immunization.²⁸⁻³⁰

REFERENCES

1. World Health Organization, Hepatitis B immunization. Introducing hepatitis B into national immunization services. (Fact sheet.) Geneva, 2001 unpublished document WHO/V&B/01.28. Available online at: www.who.int/vaccines-documents/DocsPDF01/www598.pdf (Accessed March 20, 2005).
2. Centers for Disease Control and Prevention. Hepatitis B virus: A comprehensive strategy for eliminating transmission in the United States through universal childhood vaccination. *MMWR* 1991;40:RR-13:1-25.
3. National Advisory Committee on Immunization. *Canadian Immunization Guide*, 6th ed. Ottawa, ON: Canadian Medical Association, 2002;53.
4. Krahn M, Guasparini R, Sherman M, Detsky AS. Costs and cost effectiveness of a universal school-based hepatitis B vaccination program. *Am J Public Health* 1998;88(11):1638-44.
5. Wiebe T, Fergusson P, Horne D, Shanahan M, Macdonald A, Heise L, Roos LL. Hepatitis B immunization in a low-incidence province of Canada: Comparing alternative strategies. *Med Decision Making* 1997;17(4):472-82.
6. Margolis HS, Coleman PF, Brown RE, Mast EE, Sheingold SH, Arevalo JA. Prevention of hepatitis B virus transmission by immunization. *JAMA* 1995;274(15):1201-8.
7. Krahn M, Detsky AS. Should Canada and the United States universally vaccinate infants against hepatitis B? A cost-effectiveness analysis. *Med Decision Making* 1993;13(1):4-20.
8. Dobson S, Scheifele D, Bell A. Assessment of a universal, school-based hepatitis B vaccination program. *JAMA* 1995;274(15):1209-13.
9. Patrick DM, Bigham M, Ng H, White R, Tweed A, Skowronski DM. Elimination of acute hepatitis B among adolescents after one decade of an immunization program targeting Grade 6 students. *Pediatr Infect Dis J* 2003;22(10):874-77.
10. British Columbia. Provincial Health Officer. A report on the health of British Columbians: Provincial Health Officer's annual report 1998. Feature report: Immunization. Victoria, BC: Ministry of Health, 1999. Available online at: <http://www.healthplanning.gov.bc.ca/pho/pdf/phoannual1998.pdf> (Accessed March 20, 2005).
11. Dawar M, Dobson S, Kallos A, LaJeunesse C, Weatherill S, Daly P. Measuring hepatitis B uptake in a new universal infant program. *Can J Public Health* 2002;93(4):281-84.

12. Provincial Health Officer of British Columbia. The Health and Wellbeing of People in British Columbia: Provincial Health Officer's Annual Report 2002. Victoria, BC: Ministry of Health and Ministry Responsible for Seniors, 2002;1000. Available online at: <http://www.healthplanning.gov.bc.ca/pho/pdf/phoannual2002.pdf> (Accessed March 20, 2005).
13. Statistics Canada. Births and birth rate, by provinces and territories. Available online at: www40.statcan.ca/101/cst01/demo04a.htm (Accessed May 3, 2005).
14. BC Stats. BC Municipal Population Estimates 1996-2004. Available online at: www.bcstats.gov.bc.ca/data/pop/pop/mun/Lyn9604a.htm (Accessed May 3, 2005).
15. Lynn MR. Determination and quantification of content validity. *Nurs Res* 1986;35:382-85.
16. Pielak KL, Hilton A. University students immunized and not immunized for measles: A comparison of beliefs, attitudes and perceived barriers and benefits. *Can J Public Health* 2003;94(3):193-96.
17. Haimes K, Schouten H, Harris T, Belzak I, Canadian Immunization Registry Network. National Standards for Immunization Coverage Assessment: Recommendations from the Canadian Immunization Registry Network. *Can Commun Dis Rep* 2005;31(9):93-97.
18. Scheifele DW, Lajeunesse C, Marty K, Chen L. Comparison of physicians and health department staff as timely providers of childhood vaccines. *BC Med J* 1996;38(7):372-74.
19. Watts J. Review of immunization delivery. A cost-effectiveness analysis report for the Deputy Provincial Health Officer and the Director, Public and Preventive Health. Victoria, BC: Ministry of Health and Ministry Responsible for Seniors, 1998.
20. Kolasa MS, Bisgard KM, Prevots DR, Desai SN, Dibling K. Parental attitudes toward multiple poliovirus injections following a provider recommendation. *Public Health Rep* 2001;116(4):282-88.
21. Larcher VF, Bourne J, Aitken C, Jeffries D, Hodes D. Overcoming barriers to hepatitis B immunisation by a dedicated hepatitis B immunisation service. *Arch Dis Child* 2001;84:114-19.
22. Taylor JA, Darden PM, Slora E, Hasemeier CM, Asmussen L, Wasserman R. The influence of provider behavior, parental characteristics, and a public health initiative on the immunization status of children followed by private pediatricians: A study from pediatric research in office settings. *Pediatr* 1997;99(2):209-15.
23. Richards A, Sheridan J. Reasons for delayed compliance with the childhood vaccination schedule and some failings of computerised vaccination registers. *Aust N Z J Public Health* 1999;23(3):315-17.
24. Bigham M, Copes R. Thimerosal in vaccines – a trade-off between its contribution to overall mercury exposure and risk of adverse effects versus the risk of vaccine-preventable disease. *Drug Safety* 2005;28(2):89-101.
25. Health Canada. Canadian National Report on Immunization, 1996 *Can Commun Dis Rep* 1997;23(S4). Available online at: http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/97vol23/23s4/23s4k_e.html#six (Accessed May 12, 2005).
26. Bigham M, Scheifele D, Dobson S. Impact of the media on vaccine uptake in British Columbia's grade 6 hepatitis b immunization program. *CCDR* 1999;25(10):89-93.
27. Gangarosa E, Galazka A, Wolfe C, Phillips LM, Gangarosa RE, Miller E, Chen RT. Impact of anti-vaccine movements on pertussis control: The untold story. *Lancet* 1998;351:356-61.
28. Ball LK, Evans G, Bostrom A. Risky business: Challenges in vaccine risk communication. *Pediatr* 1998;101(3):453-58.
29. Halperin SA. How to manage parents unsure about immunization. *Can J Continuing Med Education* 2000;62-74.
30. Stoto MA, Evans G, Bostrom A. Vaccine risk communication. *Am J Prev Med* 1998;14(3):237-39.

Received: June 14, 2004
Revisions requested: November 19, 2004
Revised ms: May 17, 2005
Accepted: August 3, 2005

RÉSUMÉ

Introduction : En 2001, la Colombie-Britannique a mis en place un programme d'immunisation infantile contre l'hépatite B (HB). L'objectif de cette étude était d'évaluer la couverture vaccinale d'une cohorte d'enfants britanno-colombiens résidant à l'extérieur de la région sanitaire de Vancouver-Richmond et admissibles à la vaccination lors des six premiers mois du programme. L'étude évaluait aussi les déterminants reliés à l'attitude et au comportement des parents ou tuteurs vis-à-vis l'immunisation contre l'HB.

Méthode : Nous avons mené une étude transversale auprès d'un échantillon aléatoire d'enfants nés entre le 1^{er} janvier et le 30 juin 2001. Les données concernant la couverture vaccinale ont été obtenues en consultant le système d'information de la santé publique de la Colombie-Britannique (PHIS) et en menant un sondage téléphonique entre les mois d'octobre 2002 et de janvier 2003 auprès des parents ou tuteurs de 487 enfants admissibles. Pour le sondage, nous avons interrogé les parents ou tuteurs, en utilisant l'échelle du document « Immunization Health Belief Model », au sujet de leurs attitudes et comportements à l'égard de la vaccination.

Résultats : La couverture vaccinale incluant au moins une dose du vaccin contre l'HB était de 89 %, et celle incluant trois doses du vaccin était de 78 %. L'immunisation contre l'HB était significativement associée ($p < 0,001$) à la recommandation d'un professionnel de la santé. La crainte des effets secondaires indésirables était la principale raison évoquée par les parents pour refuser de faire vacciner leur enfant.

Discussion : Soixante-dix-huit p. cent des enfants ont reçu les trois doses de vaccin nécessaires pour être protégés contre l'HB. Les conseils et recommandations d'un médecin ou d'une infirmière ont fortement influencé le comportement des parents concernant l'immunisation de leurs enfants contre l'HB.

Canadian HIV/AIDS Information Centre

Canadian Public Health Association

The services you can trust

1-877-999-7740

Centre canadien d'information sur le VIH/sida

Association canadienne de santé publique

Des services dignes de confiance

www.aidssida.cpha.ca