In this assignment, I would like to discuss about Meningitis B vaccine, the vaccine which is licensed for use in New Zealand but is not on the national immunization schedule. I will also briefly describe the disease it prevents, New Zealand epidemiology. The vaccine will also be described in term of vaccine efficacy, usage, administration, contraindication and side effects. Lastly, there will be the including the vaccine in the schedule.

1. ***WHAT IS MENINGOCOCCAL DISEASE?***

Meningococcal disease is an illness caused by the bacteria Neisseria meningitidis. At least 13 groups of meningococci can be differentiated based on the chemical and immunological properties of the capsular polysaccharides. The meningococcus has five main groups are A, B, C, w135 and Y. In New Zealand, group B meningococcal disease accounts for the majority of cases around 93%. Group C around 6% group Y accounts for a small number of cases in each year and group A rarely causes disease (MOH, 2004).

The two common of meningococcal infection are meningococcal meningitis which of the membranes that surround the brain and the spinal cord. And the meningococcemia is the infection of the blood stream. An individual infected may suffer one or both of these diseases (http://dermnetnz.org, 2002). Meningococcal invasive disease usually has

a sudden onset with fever, malaise, prostration and a variety of other possible symptoms including nausea, vomiting and headache. Invasive meningococcal disease can also give rise to arthritis, myocarditis, pericarditis, endophthalmitis and pneumonia.

2. HOW TO GET MENINGOCOCCAL DISEASE

Neisseria meningitidis bacteria are spread from person to person by inhaling when infected person sneezes cough or close contact. Carrier rates depend on age and the highest rate is found in young adults 15-24 years at 20% - 40%.

3. EPIDEMIOLOGY

Invasive meningococcal disease is at epidemic proportions in New Zealand population and is New Zealand's most serious communicable disease problem, as measure by the size and impact of the epidemic.

In 1990, prior to the start of the current epidemic, 53 cases of meningococcal disease were notified in New Zealand. In the second half of 1991 a group B strain caused a sudden increased peaking at 613 in 1997. Since 1995 the proportion of B group B isolates of this strain, has averaged 80 – 90% annually. From 1998 to 2002, an average of 526 cases per year was notified, with the 650 cases notified in 2001 the highest since the start the epidemic. In 2004 a total of more than 5600

cases had been notified since the start of the epidemic, 222 deaths recorded (MOH, 2004).

The highest incidence is in Mori and Pacific Island children in the Auckland region.

4. HOW TO PREVENT MENINGOCOCCAL DISEASE

There are two ways to prevent which is immunization with vaccines and giving antibiotic therapy to close contacts of patients with the meningococcal disease.

5. MeNZB VACCINE

A new vaccine called MeNZB has been developed to help protect children and young people in New Zealand against the strain of meningococcal B disease that is causing an epidemic in New Zealand.

MeNZB vaccine is an outer membrane vesicle vaccine. The active components in the vaccine are the vesicles (protein) from the outer (cell) wall of the New Zealand strain of meningococci. MeNZB vaccine contains: aluminum hydroxide as the adjuvant, histadine buffer to stabilize the pH of the vaccine and normal saline (Peltola, 1998).

6. PREVENTION

The epidemic strain of meningococcal disease that the targeted by MeNZB vaccine continues to causes the majority of meningococcal

disease cases. The introduction of the MeNZB vaccine will significantly impact on the number of notified cases of epidemic train group B meningococcal disease during 2005 with the likely continuance in the background rates for other serogroups and sub-strains of serogroup B meningococcal disease (MOH, 2004).

However, the Meningococcal B Immunization Program has commenced in the highest risk areas of New Zealand and will continue to be rolled out during 2005 throughout the rest of the country (MOH, 2004).

7. CLINICAL EFFICACY

MeNZB vaccine may not protect every person who receives the three doses nut it is expected that most people will be protected. While the exact period is unknown, protection is expected to last for a number of years. Data from trials using a vaccination schedule of 3 doses MeNZB given with an interval of 6 weeks demonstrate that 55% of infants (6 weeks), 74% older infants(6 weeks), 75% toddlers, 76% children, and 93% adults developed a 4-fold rise(compared with pre-vaccination values) in serum bactericidal antibody titres 4-6 weeks after the third dose. The necessity for a booster dose has not been established but is under evaluation.

A number of observational studies are planned post-licensure to assess the effectiveness of the vaccine.

8. METHOD OF ADMINISTRATION

The vaccine (0.5 ml) is intended for deep intramuscular injection, preferably in the anterolateral thigh in infants/toddlers and in the deltoid region of the non dominant arm in toddlers, older children, adolescents and adults. The vaccine can be administered concomitantly with routine immunization DTaP-IPV, Hib-HBV vaccines. Separate injection sites must be used if these vaccines are administered at the same time. The vaccines must not be infected intravenously, subcutaneously, or intradermally and must not be mixed with other vaccines in the same syringe.

9. CONTRAINDICATIONS

Persons having shown signs of hypersensitivity to any component of the vaccine or persons having shown signs of hypersensitivity after previous administration of MeNZB.

As with other vaccines, administration of MeNZB should usually be postponed in persons with an acute febrile illness (fever > 38.5) and a pregnant person.

10. UNDESIRABLE EFFECTS

The majority of reactions were self-limiting and resolved within the follow-up period. In all age groups injection site reactions (including redness, swelling, and indurations) were very common.

Tenderness/pain was the most common injection site reaction. However, these were not usually clinically significant. Crying (infants), irritability, sleepiness, change in eating habits, diarrhoea and vomiting, and fever of at least 38.0 ^{0}C (infants, toddlers) were very common after vaccination. Most of these occurred at a similar rate in the control vaccine groups, where studied. An increase of the body temperature in infants 6 hours after vaccination was observed in up to 20% of all infants receiving MeNZB in the trials. Most infants had normal body temperature by the second day after vaccination.

11. DISCUSSION

A vaccination schedule of three (four for infants) doses MeNZB given with an interval of 6 weeks between doses induces a humoral immune response against the New Zealand strain.

Infants are the group at highest risk of the epidemic strain of group B meningococcal disease. It is therefore recommended that the first three MeNZB vaccine doses be given concurrently with other childhood vaccines:

- Dose 1 at six weeks of age
- Dose 2 at three months of age (13 weeks of age)
- Dose 3 at five months of age (at least 21 weeks of age)

And then: Dose 4 at 10 months of age (at least 43 weeks)

These dose intervals are to ensure the MeNZB vaccine stimulates the optimum immune response as recorded in the clinical trials, while offering protection as early as possible.

REFFERENCES

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