BEXERO- CLINICAL DEVELOPMENT FOR BETTER IMMUNIZATION AGAINST MENINGITIS **B**

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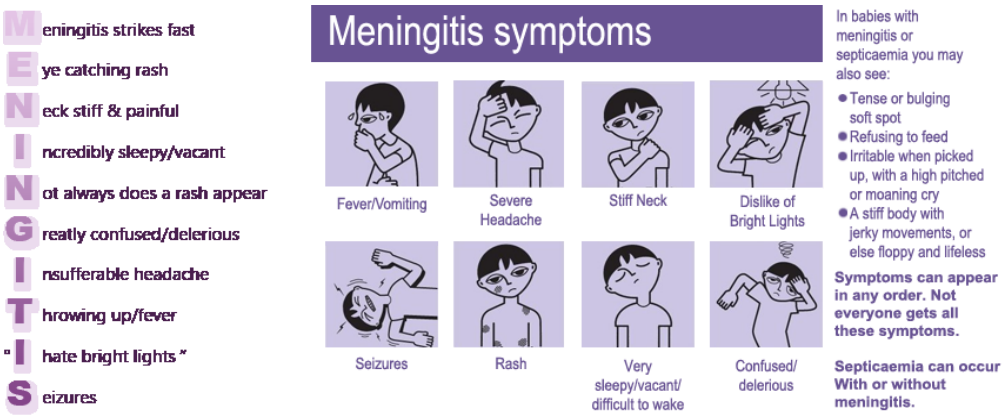
ABSTRACT:Meningitis is an acute inflammation of the protective membranes covering the brain and spinal cord, known collectively as the meninges caused by infection with , bacteria such as *Neisseria meningitides,* viruses *herpes simplex and* other microorganisms, Meningitis can be life-threatening medical emergency. Meningococcus vaccines exist against groups A, C, W135 and Y but it is difficult to develop vaccine against B as its surface proteins (which would normally be used to make a vaccine) only elicit a weak response from the immune system, or cross-react with normal human proteins. Now it is possible with Bexsero is a multicomponent Meningococcal Serogroup B vaccine is specifically indicated for active immunization to prevent invasive disease caused by *Neisseria meningitides* serogroup B. Bexsero is first approved for use in individuals 10 through 25 years of age as suspension as a 0.5 ml in two doses each at least 1 month apart as intramuscular injection into the deltoid muscle of the upper arm.Bexero is proven with good safety profile.

Keywords:Meningitis, Vaccinaction, Bexsero

Meningitis is an acute inflammation of the protective membranes covering the brain andspinal cord, known collectively as the meninges.[1] The inflammation may be caused by infection with viruses, bacteria such as Neisseria meningitidis or othermicroorganisms, and less commonly by certaindrugs. [2] Meningitis can be life-threatening because of the inflammation's proximity to the brain and spinal cord; the condition is classified as a medical emergency. [1] [3]The larger epidemics have affected mainly the cities of northern India and have almost universally been caused by meningococci belonging to serogroup A. [4] Ninety seven cases of possible meningitis (> 10 WBC/microl in CSF) were reported, an annual incidence of 86 per 100,000 (95%CI 69 to 109) in 0-4 yr old children, and 357 per 100,000 in 0-11 months infants. In 2010 it was estimated that meningitis resulted in 420,000 deaths,[5] excluding cryptococcal meningitis.[6] In 2013 meningitis resulted in 303,000 deaths – down from 464,000 deaths in 1990. [7] Clinical presented as severe headache, nuchal rigidity.[8] The infection may trigger sepsis, a systemic inflammatory response syndrome of falling blood pressure, fast heart rate, high or abnormally low temperature, and rapid breathing.

Symptoms :



Vaccination

Immunization against *Haemophilus influenzae* type B in their routine childhood vaccination schemes. This practically eliminated this pathogen as a cause of meningitis in young children but the vaccine is still too expensive. [9] Meningococcus vaccines exist against groups A, B, C, W135 and Y. [10] Development of a vaccine against group B meningococci has proved much more difficult, as its surface proteins (which would normally be used to make a vaccine) only elicit a weak response from the immune system, or cross-react with normal human proteins. [9] Routine vaccination against *Streptococcus pneumoniae* with the pneumococcal conjugate vaccine (PCV), which is active against seven common serotypes of this pathogen, significantly reduces the incidence of pneumococcal meningitis. [9][11] The pneumococcal polysaccharide vaccine, which covers 23 strains, is only administered to certain groups (e.g. those who have had a splenectomy, the surgical removal of the spleen); it does not elicit a significant immune response in all recipients, e.g. small children. [11]

Childhood vaccination : Bacillus Calmette-Guérin is used to treat tuberculous meningitis, but its waning effectiveness in adulthood has prompted a search for a better vaccine. [9][11]

Antibiotics available : Rifampicin, Ciprofloxacin or Ceftriaxone

Management

If meningococcal disease is suspected in primary care, guidelines recommend thatbenzylpenicillin be administered before transfer to hospital. [12]

Mechanical ventilation may be needed if the level of consciousness is very low, or if there is evidence of respiratory failure.

If there are signs of raised intracranial pressure, measures to monitor the pressure may be taken; this would allow the optimization of the cerebral perfusion pressure and various treatments to decrease the intracranial pressure with medication (e.g. mannitol).

Seizures are treated with anticonvulsants.

Bacterial meningitis: Empiric antibiotics : cefotaxime or ceftriaxone , [13][14] vancomycin[3] [8][13]Chloramphenicol with or without ampicillin, [15]

Steroids : dexamethasone. [16]

Viral meningitis : Aciclovir[17]

Fungal meningitis : amphotericin B and flucytosine. [18] [19]

Because of various side effects & limitations to other drugs for treatment of meningitis, recently developed vaccine approved by FDA is coming into market - BEXSERO

BEXSERO

Bexsero is a multicomponent Meningococcal Serogroup B vaccine. Bexsero is specifically indicated for active immunization to prevent invasive disease caused by *Neisseria meningitides* serogroup B. Bexsero is approved for use in individuals 10 through 25 years of age. Men B - strong immune response in infants, toddlers and adolescents[20] [21] [22]. It is approved by FDA in Jan2015 manufactured by Bexsero. **MenB (strain NZ 98/254).**

COMPOSTION OF BEXSERO :	**OTHER INGREDIENTS:**
Bacteria	Aluminium hydroxide (adsorbant to improve immunogenicity)
Factor H Binding Protein (fHbp)	Histidine (used to regulate the PH of the vaccine)
Neisseria Heparin Binding Antigen (NHBA)	Sodium chloride*
Neisserial Adhesin A (NadA)	Sucrose*
	Water for injections*

These components help meningococcal bacteria invade and survive within the human body. In vaccinated people, the immune system can recognise and 'neutralise' these components, so the bacteria cannot make them ill. All of these components have been processed and inactivated and are not part of any living bacteria, but can still stimulate the immune system.

COST: List price of the vaccine is £75/ 7623.23 per dose excluding VAT.

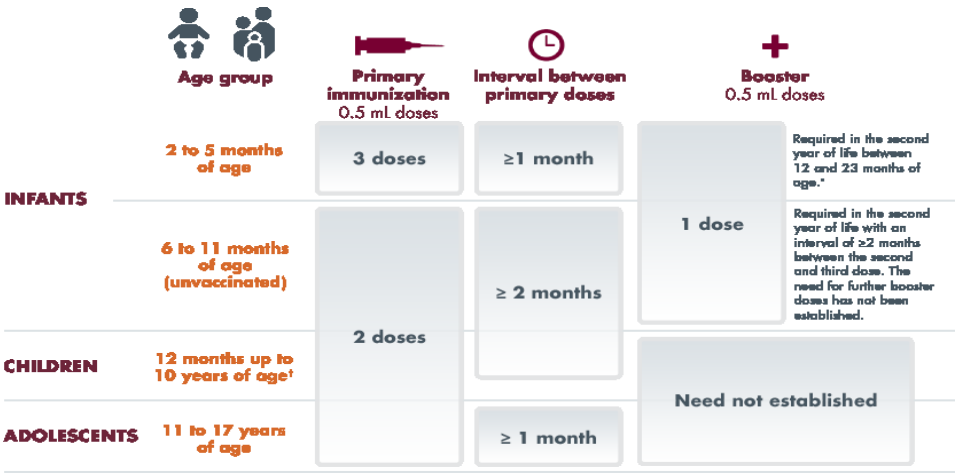
MECHANISM OF ACTION:

Bexsero is a multicomponent Meningococcal Serogroup B vaccine.NHBA, NadA, fHbp, and PorA are proteins found on the surface of meningococci and contribute to the ability of the bacterium to cause disease. Immunisation with Bexsero is intended to stimulate the production of bactericidal antibodies that recognize the vaccine antigens NHBA, NadA, fHbp, and PorA P1.4 (the immunodominant antigen present in the OMV component) and are expected to be protective against Invasive Meningococcal Disease.

DOSAGE &ADMINISTRATION :

Shake the syringe immediately before use to form a homogeneous suspension.

Administer BEXSERO suspension as a 0.5 mL in two doses each at least 1 month apart as intramuscular injection into the deltoid muscle of the upper arm.



ADVERSE REACTIONS:

Common:

Pain at the injection site (≥83%)
induration (≥28%)
erythema (≥45%)
arthralgia (≥13%).
headache (≥33%)
myalgia (≥48%)
nausea (≥18%)
fatigue (≥35%)

DRUG INTERACTIONS :

Bexsero can be given concomitantly with any of the following vaccine antigens, either as monovalent or as combination vaccines: diphtheria, tetanus, acellularpertussis, *Haemophilusinfluenzae* type b, inactivated poliomyelitis, hepatitis B, heptavalent pneumococcal conjugate, measles, mumps, rubella, and varicella.

INDICATIONS: BEXSERO® is indicated for active immunization of individuals from 2 months through 17 years old against invasive disease caused by *N. meningitidis* serogroup B strains.

WARNINGS: It is not given to individuals with Severe febrile illness,Thrombocytopenia, hemophilia, hypersensitivity, anaphylaxis. Do not inject intravascularly and do not mix with other vaccines in the same syringe.

SAFETY: Results from these trials have shown that Bexsero® has a good safety profile[23] Bexsero has no or negligible influence on the ability to drive and use machines. There was no evidence of maternal or foetal toxicity and pregnancy.

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