CHANGING PATTERN OF VACCINATION

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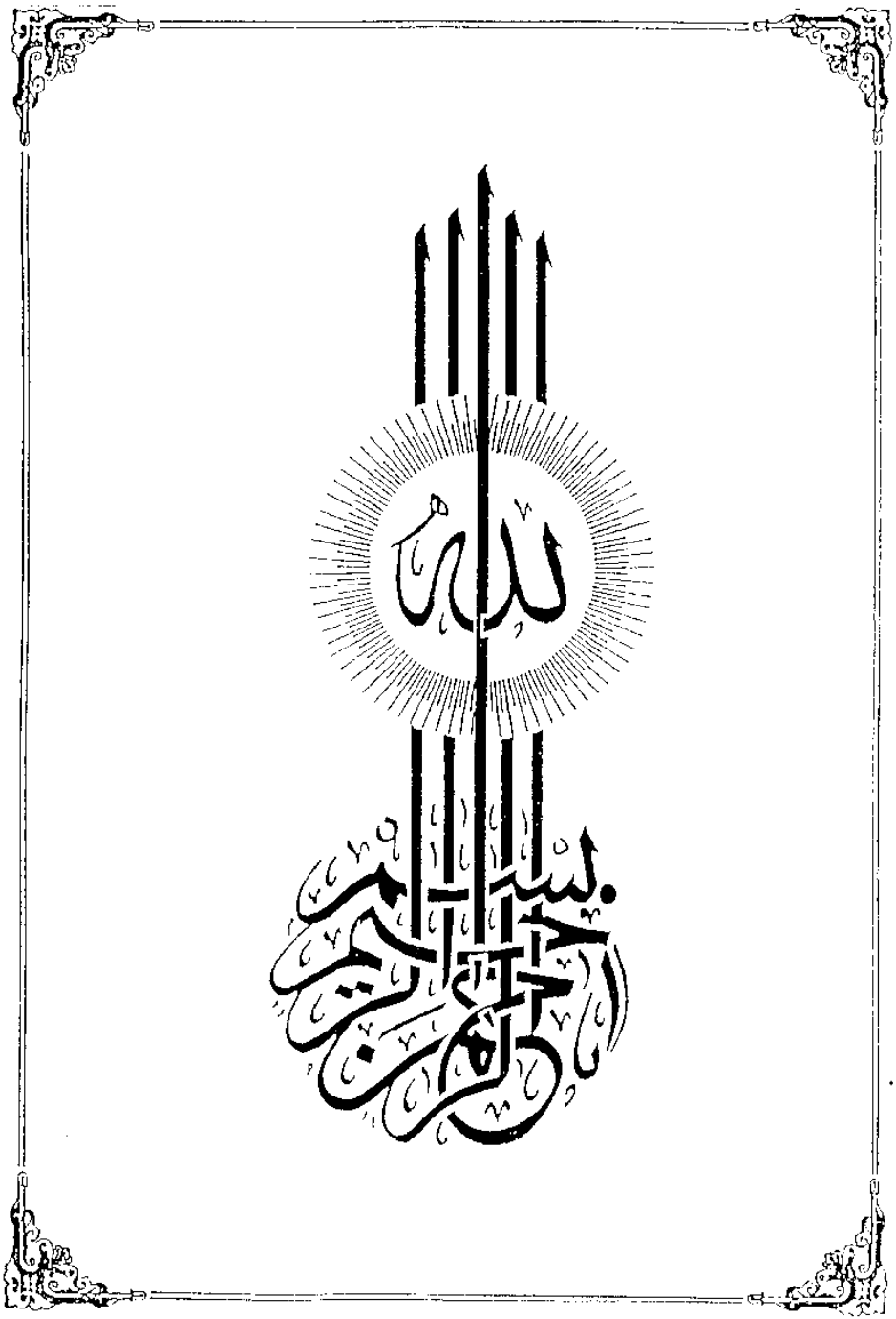

REVIEW OF LITERATURE

Safety is another vital Factor where coordination of responsibility of paromount importance.

Other factors play a vital part, such as financial provision for the enterprise, training of vaccinators, the use of simple and effective methods of vaccination and, above all, a system of surveillance to monitor the effect of vaccination. In 1967 smoll pox was endemic in 42 countries, now it is endemic in only two India & Packstan (WHO, 1975), but one important provision, namely political stability, may have been underestimated in defining the target date for eradication (Bowers,D.M.1973). The control of tuberculosis regured a different approach. The eradication of bovine tuberculosis was a necessary first step followed later by the detection and treatment of individuals with active disease by chemotherapy. Vaccination with BCG has also played a contributary part, Particularly in the prevention of tuberculous meningitis in the developing countries, but the extent to which routine administration of BCG vaccine to 10 to 13 year old children now contributes to the control of tuberculosis is open to qustion. (Karger, et al.,1973), It is more important to concentrate on protecting those at special risk such as hospital personnel and children of immigrants and deciding upon the appropriate treatment of contacts of known cases of Tuberculosis.(International symposium on vaccination

against communicable diseases 1973). The control of poliomyelitis requires yet another approach. Paralytic poliomyelitis has been virtually eliminated from highly developed countries by means of immunization with oral poliovaccine, but despite widespread use of vaccine in the developing countries, poliomyelitis continues to occur (WHO, 1974). Thus there is a risk to susceptible unvaccinated individuals travelling to endemic areas. Whenever a case of poliomyelitis is reported and confirmed, immunization of contacts in the neighbourhood is strongly recommended (Smith, 1973).

Like-wise the control of measles could be achieved if a sufficient number of children were immunised. If small outbreaks occurred then the same procedure could be used as for poliomyelitis 6 immunization of all close contacts in the neighbourhood.

The use of rubella vaccines requires yet another approach in that the objective is to protect the fetus from damage from maternal rubella and this is achieved indirectly by ensuring that women are immune before their first pregnancy.

The Final aspect of general strategy is the need for vaccine surveillance. (American Academy of Pediatrics, 1974).

The decision to use a vaccine should depend on a balance between the need for the vaccine and the risk of the vaccine. Accordingly, the routine use of a vaccine may be discontinued, as in the case of small pox vaccine. The need and risk factors are also important in explaining to parents about the need for vaccines.

Need Factors	Risk Factors
1. Severity of disease	1. Reactions to vaccine.
2. Probability of exposure.	2. Ineffective vaccine.
3. Immune status.	3. Host immunity defect.
4. Alternatives	4. Post ponement to worse time.
5. Efficacy of vaccine.	5. Contamination.

(Harrison and Fulginit 1980).

Vaccine Development and utilization (Steinherz & Fulginti 1980).

The Ideal vaccine.

The Ideal immunization has the following characteristics:

1. The antigen is pure and defined.
2. The specific response protects the individual against the disease.

3. The antigen is given in a simple , painless, one-step procedure.
4. The protection afforded is life-long without the need for boosters.
5. There are no adverse immediate or long-range side effects.
6. It is acceptable to recipients and parents or guardians.
7. It is inexpensive. The degree to which a vaccine fulfills these charcteristics is the major issue confronting the proctitioner in selection or use of a vaccine.(Fulginti 1980).

Vaccine Composition:

There is no typical vaccine, but the following categries of components are listed:

1. The principle antigen, this may be whole bacteria, or bacterial products (e.g. Toxins or hemolysins), whole viruses, or substructures of viruses.
2. Host Derived Antigens.These are proteins or other constituents of host tissue which are carried along with or intimatly associated with the virus particles.
3. Altered Antigen.These are denatured proteins and other substances which appear as a result of the virus infection on the cells in which the virus is grown.

4. Preservatives and stabilizers:

These are chamical compounds added to prevent bacterial growth or to stabilize the antigen (e.g, thiomerosal (Merthiolote), glycerine.

5. Antibiotics:

Trace amounts may be present in viral vaccines from the media used in its growth.The same vaccine from different manufacturers may contain different Antibiotics.

6. Menstrum:

This is the fluid phase of the vaccine suspension or solution. It may consist of saline or a complex tissue culture medium.

7. Unwanted or unknown constituents:

Despite elaborate precontions in preparating vaccines, viruses, or other unwanted antigens may be present.

8. Adjuvant:

This is a substance that enhances - the antigenicity of the principal antigen Material as alum, aluminum phosphate and aluminum hydroxed are in use, others (e.g. mineral oil, peanut oil) (Harrison and Fulginti 1980).

Specific Antigens:

Antigens vary in their ability to stimulate the desired immunologic response. For a given antigen the response may be variable, with some individuals responding poorly and a few not at all. Some children who receive a vaccine under optimal circumstances will simply not respond and will contract the disease upon exposure. This failing should not condemn the particular

vaccine for other children, since it may protect the vast majority. In general Adjuvant (depot type) vaccines are preferred over fluid vaccine because they provide more prolonged immunity, greater antigenic stimulation, and fewer systemic effects. (Steinherz and Fulginti 1982).

Dose of Vaccine:

Most vaccine schedules are determined by trial and error until an appropriate dose is selected. What is sought is a dose large enough to produce the immune response desired in most or all recipients, yet small enough not to cause harm, be uneconomical or be difficult to administer. While it is tempting to reduce the usual dose for reasons of economy, convenience, or comfort. This practice may result in inadequate immunization. increasing the dose may be accompanied by toxic effects or unwanted complication. (Steinherz 1982).

Route of Immunization:

The route of vaccine administration is a critical determinant of both effectiveness and softy oral or intramuscular administration of a vaccine meant to be given subcutaneously may result in ineffective immunization.

Occasionally, the side effects of a subcutaneous inoculation. This should be done only if efficancy by this route has been established.

Timing of Immunization:

In a disease prevalent in infant e.g. pertussis, immunization must be administered early enough to be effective and preventive yet late enough so that an adequate immune response occurs. Thus epidemiologic factors of the disease help to determine the timing of vaccine administration (Steinherz 1982).

There may be circumstances which warrant administration of a vaccine coincident with or shortly after exposure.

Rabies immunization at the time of a bite is the prime example, but live measles virus vaccine in a just exposed susceptible also can be done (Fulginiti,1964). The incubation period of rabies is long (weeks to months). providing time to actively immunize an exposed individual. The incubation period of natural measles is about 11 days and that of attenuated virus infection is 7 days (Katz et al, 1960), and thus it is necessary to give the vaccine within a few days of exposure.

Some vaccines reguire booster doses if long-term immunity is to be maintained. The precise timing of these additional doses is determined by both theory and experience. Some vaccines require multiple, frequent doses over the life-span of an individual (Cholero)others may be given infrequently, at long intervals (e.g. yellow fever). In general, inactivated vaccines require repetitive administration, where live vaccines do not. There are exceptions, yellow fever and small pox vaccines, both live virus must, be repeated to maintain immunity.(Fulginiti, 1982).

Special circumstances:

Immunization is part of the over all health care for an individual. Ill patients and those in the incubation period of an illness should not receive vaccines except in unusual circumstances. It is not known, however, to what extent various illnesses inhibit or diminish the immune response. For some viruses the presence of another virus or an interferon induced by another virus can inhibit effective immunization. e.g. an enterovirus infection in the intestine can inhibit polio-virus immunization.

The side effects of the vaccine can be additive to the features of a present or impending illness. For example, the Febril response and irritability of pertussis

immunization should not be added to a patient with an existent febril illness. A child with birth injury or a convulsive disorder may have his symptoms exacerbated by the fever or central nervous system (CNS) irritation of pertussis immunization. In general, a vaccine can be given to a patient with a static CNS lesion and with held from a patient with an evolving or dynamic lesion. (Fulginti, 1982).

Combination of Antigen:

Vaccines are often combined to facilitate immunization. Early studies suggested:-

1. There were limits to the responsiveness of an individual to multiple antigens.
2. Specific vaccine combinations, particularly viral vaccines, would be mutually inhibitory thus diminishing their efficacy.
3. Additive adverse effects were likely to occur,

However, experience with certain vaccine combinations has failed to substantiate theoretic risks. Thus DPT and oral poliovirus vaccine, a combination of six antigens, are given together with no decrease in immune response or increase in adverse consequences. measles, mumps,and Rubella virus vaccinies can be administered together, without il consequences or diminished effect. It is

essential that only proven combinations be employed; there is no guarantee of efficacy or safety if the physician mixes his own combinations from components designed for individual use.

Rapid seguential administration of certain vaccines has the potential for viral interfere.

For example, live measles vaccine given one week before small pox vaccination can inhibit the latter to some exent (Merigon, 1965). Thus case must be taken to observe acceptoble intervals between vaccines. In general, four or more weeks should separate live virus vaccine administrations. (Fulginti, 1982).

Safety of Vaccines:

To prevent the introduction of extraneous organisms, aseptic precoutions in the manufacture manufacture, transport, storage, and administration of biologicals are warranted. Some of the licensed products are contaminated with bacteriophage which resists inactivation. (Moody et al.,1975).

The physicians responsibility begins with receipt of the biological: Strict attention should be given to the recommended storage requirements. To avoid introduction of bacteria and hepatitis virus, most physicians use disposable sterile plastic syringes and needles.(Steiheir, 1982).

Vaccine administration:

Some specific recomendations include:

1. If a glass syringe is used, it must be sterilized before use. The American Academy of pediatrics recommends autoclaving at 121°C for 15 minutes at 15 pounds per squore inch (PSI). The use of dry heat for 2 hours at 170°C or boiling for 30 minutes also is acceptable.

2. The intended injection site and the surface of the immunization container should be cleaned with 70 percent alcohol. Some prefer 2 percent tincture of Iodine followed by 70 percent alcohol. For small pox vaccination no preparation or at most gentle washing with soop and water is indicated, since alcohol can inactivate the vaccine.

3. Vaccines with depot antigens must be injected deep into a large muscle mass, with care taken to avoid leakage into subcutaneous or dermal tissues, so as to avoid steril abscesses. The Z method of injection. (by drowing the skin over the injection). Site laterally, the tract of administration is obliterated when the skin is released at the end of injection) can be used.

4. The best site for intramuscular injections is the anterolateral thigh (vastus lateralis) or the deltoid or triceps muscle mass (in older children and adults). Interagluteal injections prior to injection to avoid introvenous administration.