

# PREVENTING DISEASES WITH VACCINES

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## INTRODUCTION

Vaccines have played an important role in preventing and decreasing the mortality and morbidity of diseases since the 19<sup>th</sup> century. Vaccines have reduced and, in some cases eliminate many diseases that killed or severely disabled people. Legislations are also in place for compulsory childhood immunization in many countries. This varies from country to country depending on the prevalence of diseases. For the traveler vaccination against certain illness are also recommended before travel. This will depend on the destination and duration of travel.

### How Vaccine works?

To understand how vaccine works we have to first understand our body immune system. Our immune system produced antibodies to eliminate foreign antigens that intrude into the body. This system is involved in deactivating viruses, bacteria and microbes. Any previous encounter is store in memory 'B' cells, which can mount an immediate defense if a similar antigen is encountered.

There are two types of vaccines, live attenuated and inactivated forms. Live attenuated vaccines are produced by modifying a bacteria or virus so that it can replicate and produce immunity without causing disease. Inactivated vaccines are made of bacteria and viruses killed by heat or chemicals. These microbes are not alive, nor can they replicate or cause disease in the recipient. Vaccinations provide active immunity to the person without the morbidity associated with natural infection.

### Changing Landscape

Vaccines have changed the landscape of medicine and infectious disease. Before vaccine many children would have been paralysed from polio, born with mental retardation from congenital Rubella and permanent brain damaged from Haemophilus Influenza meningitis. The elimination of many childhood diseases has led some people to question whether vaccinations are still useful. Further there are growing concerns that vaccine may actually causes diseases such as autism, hyperactivity, development delay, multiple sclerosis, mad cow diseases, among others. This has led some parents refusing to have their child vaccinated.

The discussions of all the various problems are beyond this editorial. One of the recent problems was caused by media reports that the MMR combination vaccine causes Autism. This has been caused by two "Wakefield Studies"

(1998 and 2000) claiming that MMR vaccine cause Autism<sup>2</sup>. These two studies have so far been found to be flawed and refuted by other studies that showed that the vaccine is safe<sup>1</sup>. The other common problem is egg allergy. This occurs in about 0.5% of the population. There is a general fear that the child with egg allergy may develop severe allergic reactions to the MMR vaccine. This is a myth as MMR vaccine is propagated in chick embryo cells and not in eggs. The quantity of egg protein found in MMR is not sufficient to cause severe allergic reaction and children with egg allergy can safely received MMR vaccine<sup>3</sup>.

Vaccinations have eliminated or reduce many vaccine-preventable diseases, but these diseases still exist and can become common again if the vaccination did not continue. These diseases can pass to people who are not vaccinated. The disease burden on individual and society will be high and may results in premature deaths<sup>5</sup>. For a more detailed write-up on contraindication to vaccination the reader can consult "The Guide to Contraindication to Vaccination" developed by the National Immunization Program, Centers for Disease Control and Prevention September 2003, which is 19 pages long. It can be downloaded from the World Wide Web at <http://www.cdc.gov/nip/publications>.

### Immunization Schedule

The schedule of childhood immunization is based on research and in such a way that it gives the best immunogenic response. Different countries have different schedule depending on the prevalence of the disease. The Singapore National Immunization Schedule can be found on page 56 of the child Health Booklet produced by The Health Promotion Board Singapore. The schedule of vaccinations is subjected to change especially with the introduction of newer combination vaccines to the community. However if a child misses any vaccination, fret not, just start again where it is left off.

### Travel vaccines

Immunization before travel decreases the risk of specific disease for the traveler as well as the risk of international spread of the diseases. Vaccination can be required by international health regulations or routine. Vaccination against Yellow fever is required if you are traveling to or from Equatorial Africa. Pilgrims going for Hajj in Mecca are required to be vaccinated against Meningococcal disease. Routine vaccinations for traveling should be individualized. Physician should take into account the location, duration and reason for travel. The health status of the traveler should be assessed including his expected behaviour before considering which immunization is appropriate for that individual.

## CONCLUSION

Vaccinations are important in decreasing the mortality and morbidity of vaccine-preventable disease. Many countries have legislation and National Immunization Programs that are free to residents. However, the coverage from such programs is from the ideal of 100%. All of us as primary care Physician have an important role in behaviour modification, education and ensuring that all children are properly vaccinated according the immunization schedule.

## REFERENCES

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