NEWS IN BRIEF

India Stands Tall

The quintessential made-in-India vaccine 'Rotavac' has made its debut into the Indian market, and more importantly into our collective imagination. It is an example of eunoia or 'beautiful thinking' in science. The story begun in the pediatric wards of the All India Institute of Medical Sciences (AIIMS), when Dr MK Bhan discovered a new strain of the rotavirus '116E' that infected newborn babies but did not cause disease. Meanwhile Dr Durga Rao of the Indian Institute of Science (IISc), Bangalore discovered a similar strain 'I321'. Both these strains caused no disease but in fact led to a strong protective immune response in the newborns. For two decades, the two research teams worked independently along with US partners like the Centers for Disease Control (CDC) and Stanford University to continue the study of these promising vaccine strains.

In 2000, a consortium of partners including Bharat Biotech, CDC, National Institute of Health (NIH), AIIMS, Stanford University, and IISc, submitted a proposal to PATH and DBT for support to move the two vaccine candidates through production, testing, and surveillance. In 2001, the Bill and Melinda gates Foundation-funded program started supporting them with technical knowhow. In 2003, the first adult trials of the vaccine started in AIIMS. In the next two years, trials in children and infants were completed, and in 2008 the Phase Ib/IIa demonstrated a robust 89% immune response in children. The Phase III trial in Delhi, Mumbai and Vellore started in 2011 were published in The Lancet in June 2014.

In March this year, the Health Minister, JP Nadda, launched 'Rotavac' officially into the Universal Immunization Program. It is being introduced in a phased manner, first in four Indian states: Odisha, Himachal Pradesh, Haryana and Andhra Pradesh. It is being touted as the world's cheapest vaccine. But the learning and intellectual growth of the various institutions and scientists who contributed to the development of this vaccine is priceless. Results in science are not after brief dalliances but persistent, enduring partnerships.

(*The Hindu 27 March 2016*).

Universal Vaccine Against Cancer

An international group of researchers have published a trail blazing paper which may open the doors to a universally applicable method of immunotherapy against cancer cells. They extracted RNA from cancer cells, placed them into nanoparticles of fat, and injected them intravenously into three patients with advanced malignant melanoma. The results were encouraging to say the least. All patients produced alpha-interferon and T killer cells against the tumor antigens. In one patient, scans before and after the vaccine showed that the tumor had shrunk. One patient who had his tumors removed surgically before vaccination remained tumor-free seven months later. The third, who had eight tumors with pulmonary metastasis, had no increase in those tumor size.

The phase 1 human trials were preceded by trials in mice. Similar studies in the past with tumor antigens in fat nanoparticles had failed. But this time they found that adjusting the proportions of fatty acids to RNA in the nanoparticles affected their electrical charge, which allowed them to be directed to the areas with maximal dendritic cells. In the mouse studies, all mice given the vaccine before being injected with cancer cells remained cancer-free, while all untreated mice died within 30 days.

The article is ebullient about the potential of this technique announcing that this type of vaccine is "fast and inexpensive to produce" and "virtually any tumor antigen can be encoded by RNA". It's called the Trojan Horse strategy based on the story in Greek mythology where the Greeks enter Troy using a wooden horse.
(*Nature 1 June 2016*).

How Thailand Eliminated Mother-to-child HIV Transmission

In the 1980's and 1990's Thailand was in the grip of a huge HIV epidemic with 143,000 new infections in 1991. Committed and intensive programs on awareness and condom use slashed new infections to just 8,100 in 2013. Then Thailand took a momentous decision to provide all pregnant women – including undocumented migrant workers – free antenatal care, delivery and services for HIV and syphilis. This had dramatic results. In 2000, there were 1000 children who were infected from their mothers, and it dropped to just 85 children in 2015. Such low levels of transmission are no longer considered a public health problem.

According to the Thai Ministry of Public Health, 98% of all pregnant women living with HIV have access to antiretroviral drugs, and the rate of mother-to-child transmission of HIV has been reduced to less than 2%. On June 7, the WHO announced that Thailand is officially the first Asian nation to eliminate mother-to-child transmission of HIV and syphilis. (*The Lancet 9 June 2016*).

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