Most of JAPI readers are familiar with the clinical features and have witnessed the pathetic outcome despite best attempts at treatment. This is because the patients have not received early PEP & arrive at the hospital once the full blown symptoms have set in. Dog vaccination programs have decreased the risk of rabies in a number of regions in the world.

In 2010, an estimated 26,000 died of rabies, down from 54,000 in 1990 in the world. India has the highest incidence of human rabies in the world, with more than 20,000 people dying of rabies every year. That is a third of the global toll. This is primarily because of stray dogs, whose numbers have greatly increased since 2001, as law forbids killing of stray dogs and sterilization is ineffective.

Rabies virus is a prototype of Lassavirus of the of Rabdoviridae family. It is a bullet shaped virus containing a single strand of RNA with a nucleoprotein that forms a helical coil. The virus travels in the nerves and is carried centripetally to dorsal root ganglion and thence to the brain where massive replication occurs. Negri bodies can be detected within nerve cytoplasm, mainly in hippocampus and cerebellum. Usual incubation period is 4 to 8 weeks but may vary from 5 days to 7 years. Face and neck bites have shorter incubation period. There are mainly two clinical types of rabies, encephalitic or furious rabies (in majority) and paralytic or dumb rabies (in about 20%). The patient shows mental excitement, restlessness, excessive salivation and hydrophobia, the historic name for rabies (sudden spasm of muscles of mouth, pharynx, larynx and the entire respiratory apparatus, especially at the sight of water). Hallucinations, delusions may occur due to malfunction of limbic system and brain stem. Unlike man, there is no hydrophobic syndrome in dogs. Animal runs amok, with temperamental changes and biting mania. In America, rabies is now chiefly transmitted by bats.

Gold standard in the diagnostic technique recommended by WHO is demonstration of viral antigen in brain tissue by fluorescent antibody test (FAT) and direct fluorescence assay for diagnosis (DFA)*, which provides 100% sensitivity. There are many other tests like tissue culture (RTCIT), molecular reverse transcriptase PCR (RT-PCR) requiring several weeks for the diagnosis.

Vaccine was discovered in 1885 by Pasteur and Roux. Originally it was

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harvested from infected brains of rabies victims, weakened by allowing it to dry for 5-10 days. Human diploid cell rabies vaccine was discovered in 1967 and a less expensive purified chicken embryo cell vaccine followed. Treatment is immediate thorough washing of the wound with soap water and a viricidal agent like povidone iodine or 70% alcohol, and prompt PEP with five doses of vaccine by IM or ID route over 14 days. The ID route requires lesser quantity of vaccine and is equally effective. Wound suturing is to be discouraged. CDC recommends a single dose of human rabies immunoglobulin (HRIG), but it is very expensive. HRIG is infiltrated around bites as much as possible and the rest is given by deep IM injection.

**Induced Coma - “Milwaukie Protocol”**

In 2004, an unvaccinated American teenager survived an infection of rabies. She was put in induced coma upon the onset of symptoms and given ketamine, midazolam, ribaverin, and amantidine. This was based on the hypothesis that detrimental effects of rabies were caused by temporary dysfunction of brain and could be avoided by partial halt in brain function, while protecting brain damage by giving immune system time to defeat the virus. This became known as “**Milwaukie protocol**”*. Second version omitted the use of ribaverine. Ketamine has shown potential for rabies virus inhibition in rats and 5 of the first 43 patients (12%) treated with this protocol have so far survived with varying residual disability.

September 28 is World Rabies Day (WHO), which promotes the information, prevention, and disease elimination.

**References**