INTRODUCTION

Tetanus is an acute toxaemic illness caused by the fixation of a neuroexotoxin in the Central Nervous System (C.N.S.), elaborated by the slender, spore forming, gram positive, anaerobic bacillus 'Clostridium tetani'. The word tetanus is an adaptation of the Greek word 'tetanos' which is derived from the verb 'taineo' which means to stretch. Tetanus was first described by Hippocrates in the year 460 B.C.

This disease has a global prevalence, a high mortality and continues to pose a challenge to medicine. In rural India tetanus is rated as one of the first five leading causes of death. It is an extremely painful and debilitating disease that can leave the patient in a depressed and exhausted state months after the main symptoms have passed away.

The bacillus Clostridium tetani was isolated by Nicolaier in 1884 and its exotoxin in 1890 by Kitasato. This terminal spore bearing rod shaped bacillus is an obligate anaerobe, which settles deep in dead and defenceless tissues to produce one of the most lethal infections known to man. The toxin reaches the C.N.S. and blocks in-
hibition of polysynaptic reflexes, resulting in the characteristic clinical features of this disease. Muscular rigidity persists throughout the illness, punctuated by paroxysms of painful spasms of the voluntary muscles like masseters (lock jaw), the facial muscles (risus sardonicus), the muscles of the back (opisthotonos), abdominal and lower limb muscles, as well as convulsions. The patient remains conscious throughout the illness being a silent spectator of his sufferings.

The annual mortality from tetanus all over the world is above 50,000 (Bianchi (1961), Bytchenko (1966)). However this disease is more common in tropical countries and developing nations. Tetanus is more common in places with a warm and moist climate. Over 50,000 cases are reported annually in India by Health authorities. Sasu et al (1984) reported the prevalence of tetanus neonatorum all over the 14 states and Union territories of India, the highest mortality due to tetanus being in Uttar Pradesh.

Tetanus may manifest at any age and may be divided into neonatal tetanus, childhood tetanus and adult tetanus of which the neonatal type contributes to
the highest mortality due to this illness. Geographical, social, cultural and economic factors interrelate to form an important background for the prevalence of this disease. Illiteracy, inadequate medical care, unhygienic obstetrical practices, lack of immunization and ignorance contribute to the high incidence and mortality due to this disease.

Respiratory failure is a very important problem in tetanus. Tetanic spasms narrow the upper airway, impede the mobility of the thoracic cage and abolish protective reflexes of coughing and swallowing. Infection and aspiration of gastric contents into the lungs are common sequelae. A ventilation to perfusion mismatch, further exacerbates hypoxia. Apnoic spells of central origin occur in the severest form of tetanus to which drugs used to control spasms, unfortunately contribute. In contrast to the impaired delivery of oxygen to the tissue there exists an increased demand for oxygen and calories by persistently contracting muscles (Khanna S.S. et al).

The therapy of tetanus has been a subject of dispute. Too many regimes have thus resulted with only partial success and high mortality rates. Intermittent
positive pressure ventilation (I.P.P.V.) and curarisation,
beta-blockers, tracheostomy, antibiotics, intravenous
fluids and nutrition, morphine, parenteral magnesium
sulphate infusions, centrally acting muscle relaxants
(e.g. methocarbamol), diazepam, phenobarbitone, pheno-
thiazines, chlorpromazine, paraldehyde, have all been
used as supportive therapy in tetanus, each having its
own merits and demerits. A standard form of supportive
therapy nowadays, is the use of parenteral diazepam as
sedative, methocarbamol as a centrally acting muscle
relaxant, parenteral antibiotics notably penicillin and
parenteral fluids and nutrition.

The mainstay of the treatment however
lies in the specific therapy of tetanus with tetanus
antitoxin. Initially only equine antitoxin in the form
of Antitetanus Serum (A.T.S.) was available. This too
had its own limitations. Firoir (1946) and Kryzhanovsky
(1971) demonstrated the superiority of intrathecal over
intramuscular route of A.T.S. administration. Sanders
et al, demonstrated the beneficial effects of A.T.S. in
human beings. However allergic reactions, short half life
and fear of damage to the central nervous system by the
preservatives used in the equine antitoxin have discoura-
ged its human use. Pratt went to the extent of suggesting
that intrathecal administration of A.T.S. should be stopped until a newer, safe, antitoxin without any side effects is discovered.

Fortunately now with the availability of human antitetanus immunoglobulin (T.I.G.) interest in intrathecal administration has been revived. Being a homologous protein unlike A.T.S. (equine), T.I.G. (human) does not carry the risk of sensitivity reactions including anaphylaxis. At present intramuscular, T.I.G. is still being used. However the intrathecal use of T.I.G. by some workers appears to show good results, although some have doubted its efficacy.

The theoretical basis for intrathecal administration of T.I.G. is that when given systematically the large molecules cannot cross the blood brain barrier and so cannot neutralise unfixed toxins already present in the C.N.S. (Ildirim et al). Furthermore nowadays human T.I.G. is available in purified form and in high concentrations without preservatives which could damage the C.N.S. So far only a few studies have been done on tetanus cases indicating or giving beneficial effects of the role of intrathecal T.I.G. This present study includes a study of this newer form of therapy in tetanus.
Preventing tetanus is much simpler, cheaper, easier and very effective as compared to its treatment. In the long run human health, happiness and useful longevity can be achieved at a far less expense with less suffering through primary prevention. But all this requires proper health education and management which is unfortunately lacking in the Bundelkhand region.

The Bundelkhand region comprises of five districts of Uttar Pradesh and six districts of Madhya Pradesh with a total population of over 800000 people. Though historically and culturally rich this region is a poverty stricken, illiterate and socio economically backward area thus contributing to a high incidence of tetanus in this region. Clearly there was a need to explore cheap and effective means of controlling tetanus when it had already struck the patient. Comparatively the use of I.P.P.V. and curarisation is cumbersome, expensive and requires the presence of highly skilled personnel. In rural hospitals this is not possible. Encouraging results with the use of intrathecal T.I.G. have in fact paved a new way in tetanus therapy. This would indeed be a milestone in achievement of the above goal.