INTRODUCTION
Pertussis or whooping cough is a non-invasive infection of the ciliated epithelium of the lower respiratory tract caused by *Bordetella pertussis* (Pittman, 1984a). The specific manifestations of the disease are paroxysmal coughing, lymphocytosis with rare incidences of neurological symptoms including convulsions and encephalitis. It is essentially a disease of infancy and early childhood. The disease is most fatal in early infancy and maternal antibodies do not afford any protection (Smith, 1984). The World Health Organization estimated 60 million cases of pertussis occurring annually with half a million to one million deaths (Mueller, Leeuwenburg and Pratt, 1986).

The disease has been controlled in most of the developed countries with the use of killed whole cell pertussis vaccine (Pittman, 1970; Church, 1979; Broome and Fraser, 1981; Preston, 1984a; Robinson, Irons and Ashworth, 1985). The hazards of vaccine range from minor local to systemic reactions with rare incidences of convulsions, infantile spasms and more serious neurological illnesses (Stewart, 1977; Stuart-Harris, 1979; Miller, Rose, Alderslade, Bellman and Rawson, 1981; Stetler, Mullen, Brennan, Orenstein, Bart and Hinman, 1985; Baraff, Cherry, Cody, Marcy and Manclark, 1935). Hence, the acceptability of pertussis vaccination by parents and physicians in some countries has been low (Harris, Bush and Lewis, 1979; Preston, 1982; Wardlaw and Parton, 1983a; Stewart, 1985). Despite the adverse reactions, benefits of vaccination outweigh the risks.
from the disease (Manclark and Cowell, 1984; Miller, Wadsworth, Diamond and Ross, 1985; Pollock, Miller, Mortimer and Smith, 1985; Hinman and Koplan, 1985).

A safe and effective vaccine with lesser reactogenicity is highly desirable which may be either a whole cell vaccine or a subcellular/acellular pertussis vaccine (Miller et al., 1981; Memorandum W.H.O., 1985). A number of workers from various countries have reported the production of acellular pertussis vaccine with lower toxicity and lesser side effects (Oda, Izumiya, Sato and Hirayama, 1983; Sato, Kimura and Fukumi, 1984; Roumiantzeff, Armond, Arminjon, Montagnon and Cadoz, 1986; Trollfors, 1986). An acellular vaccine may not be far away but the problems should not be underestimated (Manclark, 1981). Moreover it may take quite a long time to organise and complete the clinical trials with the acellular vaccine (Miller, 1986). In preliminary studies on whole cell pertussis vaccine, it was observed that glutaraldehyde inactivated pertussis vaccine was safer, potent and stable vaccine than the routinely produced heat inactivated pertussis vaccine (Gupta, Sharma, Ahuja and Saxena, 1987a,c,d). In the present study an attempt has been made to develop a safe pertussis vaccine studying both types of vaccines: the whole cell pertussis vaccine which is to be used in the near future and the acellular pertussis vaccine which will ultimately replace the whole cell pertussis vaccine once its clinical efficacy is established. The possibility of combining whole cell pertussis vaccine using benzethonium chloride as preservative with inactivated polio vaccine has also been investigated.