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Growth and structure of clinical trials industries in India: A systematic review

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India has emerged as a popular destination of global clinical trials (CTs). However, the processes of CT by the drug companies have been raising some critical issues on its progress, prospect and the process of clinical research as a human subject. This paper is examining such aspects of clinical research by reviewing existing literature as well as various sources of evidences. The study shows that India is the most potential destination for CTs. Over the past few years' industry became most cost efficient destination and growing faster, but recently the industry is facing serious challenges due to massive government intervention to control the operation. There was a major collapse during 2013 onward only because of some incidence of death occurred due to trials and it consequences by the government. Due to regulation, many companies have postponed trials; many have stopped operation permanently or planning to move other destination for trials. India has greater comparative advantage of cost minimization, large patient's pool and availability of skilled professionals. The only challenge facing by the industry is over regulation by the government. Thus India could be the most favourable destination if government create an industry-friendly environment by relaxing some of the regulations and encourage CRO to do trials without violating humanitarian ethics and other social norms.

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Picroside II inhibits neuronal apoptosis and improves the morphology and structure of brain tissue following cerebral ischemic injury in rats

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This paper aimed to explore the protective effects of picroside II against the neuronal apoptosis and changes in morphology and structure that follow cerebral ischemic injury in rats. A focal cerebral ischemic model was established by inserting a monofilament thread to achieve middle cerebral artery occlusion (MCAO) in 60 Wistar rats, and intraperitoneal injections of picroside II (20 mg/kg) were administered. The neurobehavioral functions were evaluated with the modified neurological severity score (mNSS) test. The cerebral infarct volumes were measured with tetrazolium chloride (TTC) staining. The morphology and ultrastructure of the cortical brain tissues were observed with hematoxylin-eosin staining and transmission electron microscopy, respectively. The apoptotic cells were counted with terminal deoxynucleotidyl transferase dUTP nick-end labeling and flow cytometry, and pERK1/2 expression was determined by immunohistochemical assay. The results indicated that neurological behavioral malfunctions and cerebral infarcts were present in the MCAO rats. In the model group, the damage to the structures of the neurons and the blood brain barrier (BBB) in the cortex was more severe, and the numbers of apoptotic cells, the early apoptotic ratio (EAR) and pERK1/2 expression were significantly increased in this group compared to the control group ($P<0.05$). In the treatment group, the neurological behavioral function and the morphology and ultrastructure of the neurons and the BBB were improved, and the cerebral infarct volume, the number of apoptotic cells, the EAR and pERK1/2 expression were significantly decreased compared to the model group ($P<0.05$). These results suggest that picroside II reduced apoptosis and improved the morphology and ultrastructure of the neurons and the BBB and that these effects resulted in the recovery of the neurobehavioral function of rats with cerebral ischemia.

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