THE STUDY ON THE EARLY DIAGNOSIS OF HYPOXIC ISCHEMIC ENCEPHALOPATHY IN NEWBORNS BY FUZZY BP NEURAL NETWORKS

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Objective: To establish an early diagnostic system for hypoxic ischemic encephalopathy (HIE) in newborns based on artificial neural networks and to determine its feasibility.

Methods: Based on published research as well as preliminary studies in our laboratory, multiple non-invasive indicators with high sensitivity and specificity were selected for the early diagnosis of HIE and employed in the present study, which incorporates fuzzy logic with artificial neural networks.

Results: The analysis of the diagnostic results from the fuzzy neural network experiments with 140 cases of HIE showed a correct recognition rate of 100% in all training samples and a correct recognition rate of 95% in all the test samples, indicating a misdiagnosis rate of 5%.

Conclusion: A preliminary model using fuzzy back-propagation neural networks based on a composite index of clinical indicators was established and its accuracy for the early diagnosis of HIE was validated. Therefore, this method provides a convenient tool for the early clinical diagnosis of HIE.