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Light microscopical evaluation of acute and chronic hypophyseal endocrinopathy process in kaolin induced hydrocephaly model

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As a consequence of hydrocephalus, affected children and adults may suffer motor, cognitive, and endocrine disturbances. In this study, we demonstrated acute and chronic endocrinopathy progress in kaolin-induced hydrocephalus by using a light microscope in Sprague-Dawley rats. 48 adult male Sprague-Dawley rats were used in this study. Hydrocephalus was induced by intracisternal injection of 0.1 ml volume of 25% kaolin solution in acute and kaolin groups in 16 rats. The same volume of sterile saline was injected into 16 rats in acute and chronic sham groups. The acute control, sham and kaolin groups were sacrificed at 4 weeks and the chronic control, sham and kaolin groups were sacrificed at 8 weeks after injection. In this study, when acute and chronic kaolin groups were compared with acute and chronic control groups, the number of somatotropic cells was decreased. There was no difference of somatotropic cells between acute and chronic kaolin groups. The number of corticotropic cells was increased in acute kaolin vs. sham groups which were compared with acute control. The rising in corticotropic cells in acute kaolin group was significantly different from acute sham group. The number of corticotropic cells in chronic control, sham and kaolin groups was normal. When acute sham and kaolin groups were compared with acute control group, a little raising in tirotropic cells were determined. Although the number of tiro tropic cells' rising in acute kaolin group was slightly more found than acute sham group in light microscopic evaluation, the rising of tirotropic cells in chronic kaolin and sham groups were not significantly different from chronic control group in statistical analysis. There was no difference between acute and chronic term control, sham and kaolin groups in mammotropic and gonadotropic cells count. The most effect of hydrocephalus that causes pituitary dysfunction was seen in somatotropic cells in this study. Although this effect was found significantly more in acute and chronic term, the response of corticotropic cells to hydrocephalus were variable which were referred in other literatures. We reached a conclusion that the rising in corticotropic cells in acute sham and chronic kaolin groups was associated with intracranial pressure fluctuations and stress, respectively which was occurred by elevated intracranial pressure. Clinically it would seem appropriate that the pituitary hormone levels must be evaluated before surgery and followed after surgery correction.

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