

精度の高い方法とされている。本法により臨床的な眼球運動の評価が精密に行えることを概説した。交流磁場の中で眼球に装着したコイルに磁場となす角に応じた誘導電位が発生することを利用して眼位のシグナルを得るもので、空間的・時間的分解能が高く、測定域が広く、安定性・線形性に優れ、回旋が測定できるなど、多くのメリットがある方法である。実際的な問題点として、眼球運動に侵襲を与えずに誘導コイルを密着させることが難しい。そこで私たちは、シリコンを材質としたソフトコンタクトレンズの中に直径 25 μm の銅線によるコイルを内蔵させた電極を考案した。被検者に使用した場合も比較的装着感は良く、正確な眼球運動の記録が可能であり、実際に臨床応用し良好な結果を得ている。衝動性眼球運動については、視覚的に誘発された眼球運動の amplitude・peak velocity・duration・skewness などのパラメーターを算出し amplitude を横軸としてプロットすることでその被検者の眼球運動の特性を概観することができる。Skewness は比較的新しいパラメーターだが、持続時間の中で最大速度に達するまでの時間的割合として算出され、速度パターンを評価する目的に有用である。追従性眼球運動については、眼球運動の測定値を微分し速度を求め、視標速度に対するゲインを求めることで評価できる。このようにして、疾患についてもその眼球運動異常を定量的に評価でき、各種疾患について検討を行っている。

8) EFFECT OF STIMULATING CEREBELLAR SURFACE ON EPILEPTIFORM DISCHARGES IN CAT EPILEPTIC MODEL

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The method of chronic cerebellar stimulation has been used to treat patient with epilepsy, but there is strongly dispute for curative effect. The effect mechanism of cerebellar stimulation is not clear yet. In order to confirm the inhibitory role of cerebellar stimulation on epileptiform discharges in cat penicillin-induced model of generalized corticoreticular epilepsy and to approach preliminarily the effect mechanism of stimulating cerebellum against epilepsy, this experiment was done.

In cats, 8 screw electrodes were symmetrically and bilaterally implanted in the skull over the frontal,

parietal, occipital and temporal lobe for recording EEG and evoked potentials. Through posterior craniotomy, bipolar silver plate electrodes were placed on the vermis and side of anterior lobe and cerebellar hemisphere. Then the cats receive an intramuscular injection of 400,000~500,000i.u of NaG penicillin, epileptiform discharges on EEG were observed. In 13 cats with ideal epileptiform discharge, stimulated the various sites placed stimulating electrodes with various parameters (it consists of pulse duration 0.1 ms, 0.5 ms, 1 ms with frequency 100 Hz, 200 Hz and voltage 2v, 6v, 10v) respectively, and recorded EEG before, during and after the stimulation. The evoked potentials averaged to 256 times on cerebral cortex were recorded while various sites of cerebellar surface were being stimulated by 0.5 ms rectangular pulses with a frequency 5 Hz and a current 2 mA respectively. The result of experiment and discussion are as follows.

1. Stimulating anterior lobe with pulse duration 0.5 ms, 1 ms and voltage 6v, 10v and high frequency can arrest the epileptic activity on EEG, the numbers of burst in one minute during the stimulation are less than those before the stimulation ($p < 0.01$), but the bursts on EEG were reappearant after the electrical stimulation terminated. The pulse duration 0.1 ms and the voltage 2v had not effect on epileptic discharge. The fibres of anterior lobe of cerebellar cortex are received by fastigial nucleus which project to the reticular formation of brain stem, which is a major projection from cerebellum to the reticular formation. The excitation of ascending reticular formation sends out nonspecific projection to cerebral cortex through the activation of nonspecific thalamic nuclei. The results of experiment show the inhibitory effect of cerebellar stimulation might be influenced by this projection.

2. Stimulating cerebellar hemisphere have not significant effect on epileptiform discharge. The stimulation of cerebellar hemisphere mainly affect the activity of specific projection from cerebellum to thalamus and motor cortex, but the present results show it might not be the principal one involved in reducing seizure activity following stimulation of cerebellar surface.

3. The cerebral evoked potentials (latency 7.8~8 ms) were recorded while stimulating cerebellar hemisphere or one side of the anterior lobe, the amplitude of evoked potential on frontal contralateral to the stimulating site is higher than one ipsilateral to stimulating site ($p < 0.001$, $p < 0.05$). But there are almost not evoked responses on the cerebral cortex by stimulating the vermis. It is considered that cerebral evoked responses to cerebellar stimulation are associated with the specific projection. Though the activation of the fastigial projection through the

reticular formation and nonspecific nuclei of thalamus to cerebral cortex is not significant in evoked responses, it might be more important in reducing seizure discharge. But why this is should be further studied.

II. 特別講演

事象関連電位の基礎とその応用

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