Physiological features of isolated cerebrum of the adult pretrigeminal cat are well-known and have been recently reviewed (7). The isolated cerebrum works in many respects normally as shown among others by the presence of ocular orienting reflexes in this preparation. In our recent study on biochemical correlates of visual learning (in preparation), the pretrigeminal transection was performed on a number of young kittens. Some features of these preparations are summarized in the present report.

Ten laboratory born kittens from three litters were used. The kittens were from 28 to 35 days old and weighed from 350 to 540 g. Five kittens were deprived of pattern vision from birth by means of double linen hoods (H kittens), and the remaining five were reared normally (N kittens).

In all kittens the brainstem was transected under ether anesthesia. Anatomical verification showed that in all kittens the transection was complete. In nine kittens it was at the rostropontine and in kitten H53 at the midpontine level. In the first few kittens a technique developed previously for adult cats (7) was closely followed. Then a number of modifications was introduced: (i) the anesthesia was kept as low as possible, (ii) the pre-transectional part of the operation was performed as quickly as possible, (iii) the kitten was warmed up already during the surgery, (iv) about 30 min after the transection 0.001 g lobeline hydrochloride was given subcutaneously, and the bladder was evacuated manually. Generally the pretrigeminal kittens required much more care than adult preparations. In two kittens (N49 and H54) spontaneous respiration was poor and a respirator had to be used (rate, 32/min; stroke, 5–8 ml).
Three kittens were sacrificed as early as 2 h after the transection because of ECoG flattening (the event not observed in adult preparations). Seven kittens were sacrificed after termination of observations lasting 4–7 h (Table I). These kittens only are described below.

Table I

ECoG activity and ocular following reflex in the pretrigeminal kittens listed according to the duration of the observation period

<table>
<thead>
<tr>
<th>Kitten</th>
<th>Litter</th>
<th>Age (days)</th>
<th>Observation (hours)</th>
<th>ECoG</th>
<th>Following reflex</th>
</tr>
</thead>
<tbody>
<tr>
<td>H55</td>
<td>1</td>
<td>28</td>
<td>7</td>
<td>Type I Type II</td>
<td>occasionally adequate</td>
</tr>
<tr>
<td>H56</td>
<td>1</td>
<td>29</td>
<td>7</td>
<td>Type I Type II</td>
<td>occasionally adequate</td>
</tr>
<tr>
<td>H57</td>
<td>1</td>
<td>31</td>
<td>7</td>
<td>Type II Type IV</td>
<td>abortive</td>
</tr>
<tr>
<td>N46</td>
<td>2</td>
<td>28</td>
<td>5</td>
<td>Type I Type II</td>
<td>occasionally adequate</td>
</tr>
<tr>
<td>N47</td>
<td>2</td>
<td>29</td>
<td>4</td>
<td>Type I Type II Type IV</td>
<td>abortive</td>
</tr>
<tr>
<td>N49</td>
<td>2</td>
<td>32</td>
<td>4</td>
<td>Type I Type II Type IV</td>
<td>abortive</td>
</tr>
<tr>
<td>H54</td>
<td>3</td>
<td>35</td>
<td>4</td>
<td>Type I Type II</td>
<td>occasionally adequate</td>
</tr>
</tbody>
</table>

After transection the eyes of the kittens were occluded with bandages soaked in saline. ECoG activity was monitored approximately every 250–1,000 nCi H³ leucine 1–3 h after the transection, their left eye was tested approximately every 30 min. The following reflex was evoked by moving vertically a piece of cotton wool in front of the kitten's eyes and recorded with EOG technique. For the purpose of the previously mentioned biochemical experiment, the kittens were given intravenously 250–1,000 nCi H³ leucine 1–3 h after the transection, their left eye was opened during the following 1–3 h, and visual stimuli were presented in the left visual field.

The features of the pretrigeminal kittens will be discussed with reference to those of adult preparations (7). During the acute stage of the adult pretrigeminally transected cat, two types of ECoG activity are observed: type I — almost continuous low-voltage activity, and type II — high-voltage activity mixed in different proportions with low-voltage activity. During both types of ECoG activity the ocular following reflex is usually adequate and presumably these ECoG types correspond respectively to the states of alert wakefulness and drowsiness of the preparations.

Type I and type II of ECoG activity were also present in our pretrigeminal kittens, except the H57 which lacked type I (Fig. 1, Table I). This agrees with the observations (1–5) that in a kitten of about 1 mo of age a mature ECoG activity is already established. In three kittens a pattern of high-voltage activity with domination of delta waves was
also present (Fig. 1). In adult preparations this activity (denoted as type IV) occurs only in the chronic stage and is considered as a manifestation of deep synchronized sleep. It is interesting that type III of ECoG activity (a pattern with domination of spindles, and in the chronic adult preparation corresponding probably to the state of light synchronized sleep) was not observed in any kitten. This is in agreement with the observation of Jouvet-Mounier et al. (2), that in a kitten cortical spindles disappear about the 25th day of age and reappear only at about the sixth week.

An adequate ocular following reflex was observed only in four kittens (Table I), and even in these cases it appeared irregularly and habituated within a few trials. In addition, visual and olfactory stimuli produced only poor ECoG arousal and pupillary dilatation. However, the small dilatation might be partly due to the relatively large background diameter of pupils, ranging from 2 to 4 mm.

These data are in accord with poor ocular responsiveness of non-operated young kittens. In five other kittens reared without hoods we tested the following reflex three times a week beginning with the third week of age. As in the pretrigeminal kittens the reflex was evoked by moving a piece of cotton wool. The adequate following reflex was observed for the first time when kittens were 21–35 days old, and in three of these kittens the reflex was irregular for the next 9–45 days. Both vertical and horizontal reflexes matured parallely. Similar data were reported by Sherman (6). During the fourth week his kittens followed objects only occasionally (10% of cases), and by the seventh week responded positively in 80%. It was also noted (3–5) that ECoG arousal response to external stimuli matures in kittens during the first weeks of life. Rogozea
and Ungher (5) observed the first typical ECoG desynchronization to a tone in the third week of life.

The results lead to the following conclusions concerning the 1 mo old kittens: (i) In normally reared 1 mo old kittens the ECoG activity is mature, whereas the ocular reflexes are still immature. Both ECoG activity and ocular reflexes are not affected significantly by the pretrigeminal transection. (ii) ECoG activity and ocular reflexes are similar in pretrigeminally transected normal and hood-reared kittens. Presumably, intact N kittens and H kittens are also similar in these respects. (iii) By analogy with adult preparations the acute pretrigeminal kittens are probably awake, except during type IV ECoG activity. This conclusion, however, needs further experimental documentation. (iv) Pretrigeminal kittens require more nursing care than adult preparations.

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