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Rabies in Zambian Children

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SUMMARY

Human rabies encephalitis is of particular interest to the doctors working in developing countries. When a person has been exposed to a suspect or rabid animal or human being specific antirabid treatment should be given. Ten of the twelve rabid children seen at Arthur Davison Hospital for Children over a 6 year period are described and the literature on treatment reviewed.

INTRODUCTION

Rabies is a good example where a joint approach between veterinary and health workers is necessary to achieve success. It is well known that vaccination of man against rabies is best done after consideration of both the epidemiological and epizootological situation of rabies in the area.

In Zambia several human cases of rabies are notified each year (Gaspar, 1976). Out of these about 50% are under the age of 15. This is evident from the notifications during an 18month period (Table 1 and Table 2). But the actual incidence may be much higher as the process of notification is by no means complete. In the opinion of rural health workers people die from rabies without notification. A number of course are regarded as “bewitched” and are taken to the traditional healer.

This paper is the result of a study of 10 children who were admitted under my care with rabies. The purpose of the paper is to recount some of the problems that were encountered.

MATERIAL

In the past 6 years 12 cases of rabies were diagnosed in children at the Arthur Davidson Hospital
They like playing with them, handling them and even children is due to the love children have for animals.

The similarity of cerebral malaria requires consideration in all cases with the diagnosis in endemic areas. This will avoid prolonged contact with other patients or unalerted staff. Strict isolation and careful nursing of the rabid person is an absolute necessity. Despite all security measures our last patient bit his mother and one of the nursing staff.

The incidence of rabies may not seem very high at first sight but hundreds of cases can result from contact with a single-rabid animal or even rabid man. This raises the question of the prophylaxis. The table below (Table 4) gives the recommendations issued by the World Health Organisation in the Chronicle in 1974.

Rabies is still a highly lethal disease. All the patients described here died giving a mortality rate of 100%. However there are some reports indicating that the disease may occur in a prolonged form (Bell, 1966; Bhatt et al., 1974), and need not always be fatal (Bell, 1966; Doege and Northrop, 1974; Hattwick et al. 1972). In the treatment of rabies the emphasis lies on intensive care with adequate sedation and assisted respiration (Rubin et al., 1970).

Much more can be achieved in the field of prophylaxis. In the majority of cases the incubation period is 3 to 8 weeks, but it may vary from 10 days to 8 months. In some cases the incubation period may be even longer (Draganescu et al., 1970). Vaccination must therefore be pursued with all vigour. The rabies virus may reach the central nervous system via the peripheral nerves or the blood stream (Krause, 1965; Schindler, 1966; Debbie, 1974). In either case the virus invades the organism very rapidly. Therefore immediate elimination of the virus from the site of infection by physical and chemical means is essential (Dean, 1966, WHO Chronicle, 1974). Immediate washing and flushing with soap and water or detergent is the most effective way. The 20% soap solution seems to be at least as effective as other chemicals, e.g. quarternary ammonium compounds, Benzalkonium, etc. After washing it is advisable to apply a concentrated alcohol solution or tincture of Iodine. The wound should then be infiltrated deeply with anti-rabid serum after testing for sensitivity to the material. The wound should be left open and unsutured and tetanus antitoxin prophylactically given.

For active immunization several different types of vaccine are available. The most common types are brain tissue vaccines. The Semple vaccine in which the virus is completely inactivated is the safest and most widely used. The Fermi vaccine contains a residue of infective virus and so its use in vaccination is highly risky. Brain tissue vaccines provide good immunological response but unfortunately contain some brain tissue antigen and may lead to allergic brain reactions. This occurs in a ratio of 1:4000 to 1:8000 people receiving vaccination (Mozar et al., 1974). These side effects are rarer in children. (Dout-
TABLE III
Symptomatology in 10 cases of rabies treated at the Arthur Davidson Hospital, Ndola.

<table>
<thead>
<tr>
<th>Name</th>
<th>Sex</th>
<th>Age (Years)</th>
<th>Injury</th>
<th>I.P.</th>
<th>Reported Manifestation</th>
<th>Provisional Diagnosis</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>K.L.</td>
<td>M</td>
<td>7</td>
<td>2 m</td>
<td>Alert, irrelevant speech, dyspnea</td>
<td>? Rabies</td>
<td>Vaccinated by 3 inoculations</td>
</tr>
<tr>
<td>2.</td>
<td>A.N.</td>
<td>M</td>
<td>8</td>
<td>4 w</td>
<td>Salivation, excited, hydrophobia</td>
<td>? Rabies</td>
<td>–</td>
</tr>
<tr>
<td>3.</td>
<td>T.M.</td>
<td>F</td>
<td>6</td>
<td>5 w</td>
<td>Violent, changed speech</td>
<td>Changed behaviour</td>
<td>–</td>
</tr>
<tr>
<td>4.</td>
<td>J.M.</td>
<td>F</td>
<td>10</td>
<td>3 w</td>
<td>Restless, dyspnea</td>
<td>C. malaria</td>
<td>–</td>
</tr>
<tr>
<td>6.</td>
<td>M.Ch.</td>
<td>M</td>
<td>11</td>
<td>4 w</td>
<td>Very excited, salivation</td>
<td>? Rabies</td>
<td>Another child died 8 weeks ago for rabies</td>
</tr>
<tr>
<td>7.</td>
<td>M.W.</td>
<td>M</td>
<td>2</td>
<td>3 w</td>
<td>&quot;Mad&quot;, restless</td>
<td>?C. Malaria</td>
<td>Treated by doctor</td>
</tr>
<tr>
<td>8.</td>
<td>J.Ch.</td>
<td>M</td>
<td>3</td>
<td>5 w</td>
<td>&quot;Maniacal&quot; mumbling strange words</td>
<td>? Rabies</td>
<td>–</td>
</tr>
<tr>
<td>9.</td>
<td>B.N.</td>
<td>F</td>
<td>7</td>
<td>2 m</td>
<td>Strange, odd</td>
<td>Psychosis</td>
<td>Treated by a trad. healer.</td>
</tr>
<tr>
<td>10.</td>
<td>Ch.L.</td>
<td>M</td>
<td>7</td>
<td>7 w</td>
<td>Violent, running into the bush</td>
<td>C. Malaria</td>
<td>Had bitten the mother.</td>
</tr>
</tbody>
</table>

M=Male     F=Female                       M=Month       W-Week       I.P. = Incubation

TABLE IV
Specific Systematic Postexposure Treatment of Rabies (WHO Chronicle, 1974).

<table>
<thead>
<tr>
<th>NATURE OF EXPOSURE</th>
<th>STATUS OF BITING ANIMAL IRRESPECTIVE OF PREVIOUS VACCINATION</th>
<th>AT TIME OF EXPOSURE</th>
<th>DURING 10 DAYS</th>
<th>RECOMMENDED TREATMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td>Contact but no lesions; indirect contact; no contact.</td>
<td>Rabid</td>
<td>–</td>
<td>None</td>
</tr>
</tbody>
</table>

II. Licks of the skin; scratches or abrasions; minor bites/covered areas of arms, trunk and legs

(a) Suspected as rabid
- Healthy
  - Start vaccine. Stop treatment if animal remains healthy for 5 days
- Rabid
  - Start vaccine; administer serum upon positive diagnosis and complete the course of vaccine

(b) Rabid;
- Wild animal, or animal unavailable for observation.

III. Licks of mucosa; major bites/multiple or on face, head, finger or neck/

- Suspected or rabid domestic or wild animal, or animal unavailable for observation
  - Serum + vaccine. Stop Treatment if animal remains healthy for 5 days A, C.

a) Observation period in this chart applies only to dogs and cats.
b) All unprovoked bites in endemic areas should be considered suspect unless proved negative by fluorescent antibody examination of brain.
c) Or if its brain is found negative by fluorescent antibody examination.
d) In general, exposure to rodents and rabbits seldom, if ever, requires specific antirabies treatment.
lik et al., 1974). The Duck Embryo Vaccine gives a lower incidence of CNS complications (Mozar et al., 1973) but it seems to be less effective. It is given in courses lasting 14–21 days with two or three booster inoculations on 10th, 20th and 90th day after the vaccination. In Zambia the Lyophylised Mouse Brain Vaccine is used.

Attempts to produce risk-free vaccines of high potency continue to be made. Cell cultures seem to hold most promise. In the USSR work is being done with hamster kidney cell cultures; in France, with fetal bovine kidney cell cultures. Human diploid cells are also being used. Preliminary tests are very promising and there is hope that something might come out of them in the near future.

Although WHO recommends the use of serum 24 hours before starting active immunisation, this field is still full of controversy. Wiktor et al. (1971) found that a single dose of the vaccine resulted in much higher virus neutralising antibody titers than the serum and three booster doses together. So more research is required on this.

The hazard of heterologous serum can be eliminated by using Human Antirabies Immunoglobulin. This should be given in doses of, 20–40 I.U./Kg of body weight (Hattwick et al., 1974; Cabasso et al., 1974; Cabasso et al., 1973).

REFERENCES


