

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

TABLE I

Rabies in human notified in Zambia in 1974 and 1975 (January-June).

	1974	1975
Children	5	5
Adults	4	4
TOTAL	9	9

TABLE II

Rabies in Zambia/1974, January-June//.

District	Number
North Western	11
Northern	8
Central	6
Copperbelt	4
North Western	1
Eastern	1
TOTAL	31

in Ndola. The data reported here was obtained from 10 cases. This is tabulated in Table 3.

The age range was 3-11 years and there were 6 males and 4 females. The diagnosis was based on both the clinical picture and the presence of recent injuries from a rabid dog or cat. The incubation period ranged between 3 weeks and 2 months. In four cases the diagnosis of rabies was correctly made by an attendant at a local health centre. A further four cases were referred to the hospital with a diagnosis of cerebral malaria. One case was queried as encephalitis and the remaining one was referred for abnormal behaviour. The course of the disease was short lasting 12 to 96 hours and the clinical picture was as classically described in the text books.

DISCUSSION

The relatively high incidence of rabies among children is due to the love children have for animals. They like playing with them, handling them and even provoking them. For this reason about 50% of all cases of rabies occur among children (Boulger and Hardy, 1960, Cereghino et al., 1970). Although the clinical picture of our patients on admission was typical, the history of illness and the course of the disease before admission was less clearly so. The similarity of cerebral malaria requires consideration in all cases with the diagnosis in endemic areas. This will avoid pro-

longed 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.

Name	Sex	Age (Years)	Injury	I.P.	Reported Manifestation	Provisional Diagnosis	Remarks
1. K.L.	M	7	Dog bite	2 m	Alert, irrelevant speech, dyspnea	? Rabies	Vaccinated by 3 inoculations
2. A.N.	M	8	Dog bite	4 w	Salivation, excited, hydrophobia	? Rabies	—
3. T.M.	F	6	Dog bite	5 w	Violent, changed speech	Changed behaviour	—
4. J.M.	F	10	Dog bite	3 w	Restless, dyspnea	C. malaria	—
5. J.J.	F.	8	Dog bite	6 w	Bizarre neurological symptoms	? Encephalitis, ? Polio	—
6. M.Ch.	M.	11	Dog bite	4 w	Very excited, salivation	? Rabies	Another child died 8 weeks ago for rabies
7. M.W.	M	2	Dog bite	3 w	"Mad", restless	?C. Malaria	Treated by doctor
8. J.Ch.	M	3	Cat Bite	5 w	"Maniacal" mumbling strange words	? Rabies	—
9. B.N.	F	7	Dog bite	2 m	Strange, odd	Psychosis	Treated by a trad. healer.
10. Ch.L.	M	7	Dog bite	7 w	Violent, running into the bush	C. Malaria	Had bitten the mother.

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

TABLE IV

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

NATURE OF EXPOSURE	STATUS OF BITING ANIMAL IRRESPECTIVE OF PREVIOUS VACCINATION		RECOMMENDED TREATMENT
	AT TIME OF EXPOSURE	DURING 10 DAYS	
I. Contact but no lesions; indirect contact; no contact.	Rabid	—	None
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.

- Observation period in this chart applies only to dogs and cats.
- All unprovoked bites in endemic areas should be considered suspect unless proved negative by fluorescent antibody examination of brain.
- Or if its brain is found negative by fluorescent antibody examination.
- 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 Lyophilised 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

- Bell, J.F., *International Symposium on Rabies. Symp. Series immunobiol. Standard (1966) (Karger, Basel) New York. 1, 287.*
- Bhatt, D.R. Hattwick M.A.W., Gerdson, R., Emmons, R.W. and Johnson, H.N. *Amer. J. Dis. Child (1974), 127, 862.*
- Boulger, L.R., and Hardy, J., *West Africa Med. J. (1960) 9, 227.*
- Cabasso, W.J., Loofbourow, J.C., Roby, R.E., Anuszkiewicz, W. *Bull. Wld. Hlth. Org. (1971) 45, 303.*
- Cereghino, J.J., Osterud, H.T., Pinnas, J.L., and Holmes, M.A., *Pediatrics (1970) 45, 839.*
- Dean, D.J., *International Symposium on Rabies. Symposium Series Immunobiol., Standard. (1966) 1, 287 (Karger, Basel) New York.*
- Doege, T.C., and Northrop, R.L., *Lancet (1974), 2, 826.*
- Doutlik, S., Vacek, Z., and Harvenkova, D., *Acta Fac. Med. Univ. Brun (1974) 45, 111.*
- Debbie J.G. *Progr. Med. Virol (1974) 18, 241.*
- Draganescu, N., Gheorghiu, V., and Dumitrescu, M.S., *Revue Roum. Inframicriobiol (1970), 7, 191.*
- Gaspar, P., *Medical Journal of Zambia (1976) 10, 6, . . .*
- Hattwick, M.A.W., Weis, T.T., Stechschulte, C.J., Baer, G.M., and Gregg, M.B., *Ann. Intern. Med. (1972), 76, 931.*
- Hattwick, M.A.W. Rubin, R.H., Music, S., Sikes, R.K., Smith, J.S. and Gregg, M.B., *J.A.M.A. (1974) 227, 407.*
- Krause, M.W., *International Symposium on Rabies. Symposium Series Immunobiol. Standard (1965) 1, 153. (Karger, Basel), New York.*
- Mozar, N.M., Finnigan, F.B., Petzold, H., Spittler, L.E., Emmons, R.W., and Rothenberg, B. *J.A.M.A. (1973), 224, 1605.*
- Rubin, R.H., Sullivan, L., Summers, R., Gregg, M.B., and Sikes, K., *J. Inf. Dis (1970) 122, 318.*
- Schindler, R. *International Symposium on Rabies. Symposium Series Immunobiol. Standard (1966) 1, 147.*
- Wiktor, T.J., Lerner, R.A., and Koprowski, H. *Bull. Wld. Hlth. Org. (1971) 45, 747.*