

Same Dog Bite and Different Outcome in Two Cases – Case Report

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ABSTRACT

There is still no cure for rabies and survival from clinical rabies is extremely rare. It is a preventable disease if the post exposure prophylaxis is initiated in time and administered as per WHO guidelines including administration of rabies immunoglobulin. The role of passive rabies immunization products is to provide the immediate availability of neutralizing antibodies at the site of the exposure before it is physiologically possible for the patient to begin producing his or her own antibodies after vaccination. In this case report, the same dog has bitten to a boy and to an adult. Local wound treatment and use of human rabies immunoglobulin as well as gluteal region as a site of bite were the probable reasons for survival of the boy. On the other hand no local wound treatment, no use of rabies immunoglobulin and finger as a site of bite are the probable reasons for death of an adult due to rabies.

Keywords: Death, Rabies, Rabies immunoglobulin, Treatment failure

CASE REPORT

A 5-year-old boy from Yavatmal District in Maharashtra State, India was bitten by a pet dog on 7th June 2010, incurring two deep lacerations on right gluteal region (WHO Class III bite). The dog was never vaccinated, showed abnormal behaviour on the day of bite and killed after second bite incident.

The boy was taken to Primary Health Centre of that village and received intramuscular injection of Tetanus Toxoid and first dose of cell culture vaccine and referred to first referral centre. From first referral centre the boy was again referred to District Civil Hospital for anti-rabies serum. Parents of the child took him to a private paediatric hospital at district place where wound was washed with soap and water and irrigated with povidone iodine. After 2h of local wound treatment, Inj. KamRAB 2 ml (20IU/kg body weight, total dose 300IU as weight was 15kg) was infiltrated into and around the wounds and advised to take remaining four doses of cell culture vaccine as per the Essen regimen. The child was visited at his home in November 2013 and found to be alive and well after three and half years of dog bite.

Within a few minutes of the above incident, the same dog has also bitten to a 30-year old male, incurring laceration on the flexor aspect of left middle finger (WHO Class III bite). The wound was not washed with soap and water. The patient was taken to Primary Health Centre of that village and received intramuscular injection of Tetanus Toxoid and first dose of cell culture vaccine and advised to take remaining four doses as per Essen regimen. The patient received 2nd, 3rd and 4th dose of cell culture vaccine as per schedule. On 1st July 2010 patient was having pain at the site of bite and headache. Parents took him to first referral centre where Medical Officer observed that patient was having aerophobia and intolerant to noise and told to the parents that the patient has developed rabies. The patient died on 3rd July 2010 i.e. on 27th day after dog bite.

DISCUSSION

Half of the global human population lives in canine rabies-endemic areas and is considered at risk of contracting rabies [1]. According to the WHO-APCRI survey the animal mainly responsible for human rabies deaths was the dog (96.2%). The majority of these were stray dogs (75.2%), followed by pets (11.1%), wild animals (3.5%) and

others/unknown (10.2%) [2]. Cats accounted for 1.7% of deaths. The use of rabies immunoglobulin was negligible (1.3%) [2].

The average incubation period varies from 20-90 days after exposure and depends on the following circumstances: (a) Severity of bite or laceration; (b) location of bite (incubation period may be shorter after bites on head, neck and fingertips, than bites on the trunk or lower extremities due to extensive nerve endings in the former areas); (c) age of the victim (children have faster onset) [3]. When the bites are severe, multiple, and particularly those on head, neck, face, hands and genitalia are known to have a short incubation period, of even four days only [4].

In the present case report an adult died on 27th day after bite and the boy is alive and well after three and half years after dog bite. In this case the probable reasons for the cause of death due to rabies in an adult might be non receipt of local wound treatment and RIG (rabies immunoglobulin) as well as finger as a site of bite. In contrast to this receipt of local wound treatment, use of human rabies immunoglobulin and gluteal region as a site of bite are the probable reasons for survival of the boy.

Prompt and adequate local treatment of all bite wounds and scratches is the first requisite and is of utmost importance. The purpose of local treatment is to remove as much virus as possible from the site of inoculation before it can be absorbed on the nerve endings. Local treatment of wounds is of maximal value when applied immediately after exposure but it should not be neglected if several hours or days have elapsed. Local treatment comprises of immediate flushing and washing the wound(s), scratches and the adjoining areas with plenty of soap and water, preferably under a running tap, for at least 15 minutes. This is followed by application of virucidal agents - either alcohol (400-700ml/litre), tincture or 0.01% aqueous solution of iodine or povidone iodine. Bite wounds should not be immediately sutured to prevent additional trauma which may help spread the virus into deeper tissues. If suturing is necessary, it should be done 24-48 hours later, applying minimum possible stitches, under the cover of RIG locally. Animal experiments have shown that local wound treatment can reduce the chances of developing rabies by upto 80% [5].

Following a rabid animal bite, the modern rabies vaccines viz. human diploid cell vaccine, purified chick embryo cell rabies vaccine,

purified verocell rabies vaccine and purified duck embryo vaccine, even if given immediately after the bite, are capable of producing the seroprotective titre (0.5IU per ml) in the bitten person only by about day 14 (14 days after the first dose of vaccine), thus leaving the person vulnerable to rabies during this window period of the first fortnight. Thus, these individuals are vulnerable to rabies despite the timely and full 5-6 doses of any modern rabies vaccine and proper wound care. In these individuals only RIG are life saving, as their timely and proper administration neutralizes the virus in the wounds and aborts the risk of developing rabies [4].

Equine rabies immunoglobulin (ERIG) is economical as compared to human rabies immunoglobulin and hence more affordable to patients in developing countries, like India. However, ERIG has potential to cause anaphylaxis, serum sickness and other allergic reactions and thus, physicians are hesitant to use it [6]. The current incidence of anaphylaxis to modern ERIG is about 1:35,000-40,000 cases, which can be considered rare. Till date none has died of anaphylaxis following ERIG [4]. HRIG produced under good manufacturing practices is virtually devoid of serious adverse reactions. The dose for HRIG is 20 IU/kg body weight, and for ERIG and F(ab)₂ products is 40 IU/kg body weight [1].

It is important to infiltrate all wounds to neutralize the virus locally and thus systematic administration of RIG is of very little value. The common mistake done by doctors (mostly for convenience) is to inject the full dose of RIG intramuscularly, most often in gluteal areas, which serves very little purpose [7]. RIG for passive immunization should not be injected later than seven days after the first dose of postexposure vaccination because an active antibody response to the cell-culture and embryonated egg based vaccines is presumed to have occurred [5].

Behera TR et al., [7] studied use of equine rabies immunoglobulin in patients positive to skin test dose of ERIG and revealed that even in cases with positive skin reaction, ERIG can be safely administered with premedication with anti-histamine and there was no systemic anaphylaxis. In another study the author studied postexposure prophylaxis for rabies with ERIG and IDRV in children and observed that only 7.2% children were positive to skin test dose of ERIG.

These children were administered ERIG after giving oral anti-histamine (Tablet Levocetirizine 5 mg) and no one was suffered from anaphylaxis [8].

So it is time that the medical fraternity has to be made and encouraged to use ERIG in category III animal exposures so that this fatal disease can be averted. Sudarshan MK et al., [2] carried out a national multi-centre epidemiological survey for assessing the burden of human rabies in India and revealed that incomplete treatment had resulted in some rabies deaths as occurred in an adult in the present case report. Generally, it is believed that only severe, multiple wounds and bites on head, face and hands are category III exposures, which is wrong. According to WHO, all wounds that bleed, irrespective of site, number and severity are category III exposures [4]. Thus in addition to local wound treatment, which is an essential part of postexposure prophylaxis, passive immunization with RIG is highly recommended for category III animal bites to provide immediate protection against rabies.

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