Original Article

A critical appraisal of usage of rabies immunoglobulin in an anti-rabies clinic in India*

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Rabies is a practically 100% fatal viral encephalomyelitis. It is transmitted to man mostly following bite by a rabid dog or cat. In India annually an estimated 20,000 human rabies deaths occur consequent to about 17 million animal/dog bites[1]. Following bite by a rabid animal, administration of a modern rabies vaccine using a regimen approved by World Health Organization (WHO) stimulates production of neutralizing antirabies antibodies by the patient's immune system. Protective levels of these antibodies are seen 7 to 14 days after the first dose of vaccine. Adequate serotitres can be expected in all the vaccinees by day 14. When the bites are on the head, neck, face & hands, the incubation period will be shorter. Thus, such patients are vulnerable to develop rabies during this window period of 7 to14 days despite the timely and full course of any antirabies vaccine and wound care. The rabies immunoglobulins (RIGs) are readymade antirabies antibodies which provide passive immunity and thus offer immediate protection. Hence, administration of RIGs, after thorough cleansing of wounds, following severe (category III) exposure to rabies is life saving as their timely and proper administration neutralizes the virus in the wound and aborts the risk of developing rabies.

According to WHO all of the RIG, or as much as anatomically possible (but avoiding possible compartment syndrome), should be administered into or around the wound site or sites. The remaining immunoglobulin, if any, should be injected intramuscularly at a site distant from the site of vaccine administration. RIG may be diluted to a volume sufficient for all wounds to be effectively and safely infiltrated[2].

These guidelines are followed by Government of India[3] and professional bodies like Association for Prevention and Control of Rabies in India[4]. However, some experts consider systemic administration of RIGs as wasted[5]. At a recent expert consultation of WHO, the usefulness of systemic administration of RIG was debated and recommended that new in-vitro and in-vivo research be encouraged to determine the quantity of RIG (in IU) required on site, with or without distal parental RIG administration[6].

Hence, this study was conducted with the objective of finding out the ratio of volume of RIG injected into/around the wound/s (local infiltration) to the volume of RIG injected by intramuscular (systemic) route. In this context, the data from the antirabies clinic of Kempegowda Institute of Medical Sciences, Bangalore, a centre specialized for

Table-I:
Details of exposure to rabies

Sl. No.	Exposure to rabies		No.	%
1	Total cases		6664	100
	Category III (severe exposure) cases		3109	46.6
	Biting animal/rabies exposure		3109	100
	Dog		2918	93.8
	Monkey		98	3.2
2.	Cat		45	1.5
	Wild animals		23	0.7
	Exposure to rabid cow's milk / secretion		19	0.6
	Exposure to case of Hydrophobia		6	0.2
	Profile of Patients/subjects		3109	100
	Sex	Male	2182	70.2
		Female	927	29.8
3.	Age Groups (in years)	0-4	418	13.5
		5-14	907	29.2
		15-44	1207	38.8
		45-64	434	13.9
		65+	143	4.6
4.	Type of animal bite wounds / injuries (multiple responses)		3345	100
	Abrasions / scratches		1589	47.5
	Lacerations		1284	38.4
	Transdermal bite / puncture		330	9.9
	Cuts		138	4.1
	Avulsions / fractures		4	0.1
5.	Distribution of wounds (multiple responses		3366	100
	Lower limbs		1763	52.4
	Upper limbs		961	28.5
	Head / neck		421	12.5
	Trunk		207	6.2
	Genitalia		14	0.4

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Table-2
Usage of RIGs in persons exposed to rabies

Sl. No.	Usage of RIGs	No.	%
1	**Rabies exposed persons who received RIGs**	3109	100
	ERIG	2904	93.4
	HRIG	199	6.4
	Refused / could not afford / referred to Govt. hospital	4	0.6
2.	**Volume (in ML) of RIGs received**		
	Children (<15 years)	1323	-
	Mean	2.85 ML	-
	Range	0.4 to 10.00 ML	-
	Adults (>15 years)	1780	-
	Mean	7.89 ML	-
	Range	3.30 to 10.00 ML	-
3.	**Volume (in proportion) of RIGs used by different routes of administration**		
	ERIG	2904	-
	Local infiltration only	-	73.5
	Local infiltration plus systemic injection	-	25.8
	Systemic injection only	-	0.7
	HRIGs	199	-
	Local infiltration only	-	74.6
	Local infiltration plus systemic injection	-	23.0
	Systemic injection only	-	2.4

administration of RIGs, was analyzed for 3 years duration from July, 2008 to June, 2011. In this centre the dosage of RIG required for each patient was calculated as per the guidelines of the manufacturer. When the calculated dose of RIG was not adequate sterile normal saline was used as diluent to make up for the volume sufficient to infiltrate all wounds.

A total of 6664 cases of rabies exposures were treated during this period and of these 3109 (46%) were categorized as "severe exposures "or belonging to Category III. This lower percentage/proportion of category III exposures is due to the fact that many trivial and minor exposures come for consultations and counseling and others visit /referred from outside centres come to receive vaccine only. Majority (93%) of these were due to dog bites. The victims were mostly males (70%), adolescents and adults (57%). The bite wounds were mostly abrasions/ scratches (47%) & lacerations (38%) and found on the upper and lower limbs (81%) (Table-1). In about 93% cases ERIG was used, in 6% HRIGs and the remaining (~1%) could not afford / referred/refused RIG. In children (<15 years age) the mean volume of RIG used was 2.85 mL per patient and in adolescents/ adults (>15 years) 7.89 mL. In these cases about three fourths (∝ 74%) of the total dose/ volume of RIG was used exclusively for local infiltration of wounds, 25% injected both locally and systemic and 1% injected by only systemic route (Table-2).

In conclusion, the usage of RIGs was found be in accordance with the current recommendations of WHO. Besides it shows that only about one fourth (25%) volume of the total dose of RIG was injected systemically or the ratio of local: systemic administration of RIG was 3: 1.

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