



Intradermal Antirabies Vaccination: A Technique to Increase Compliance

KEYWORDS

Intradermal, Adherence, Antirabies vaccination, Compliance

* Dr. Rohi KR

Dr. Mankeshwar R

Assistant Professor, Department of Community Medicine, I.G.G.M.C. Nagpur, * Corresponding Author

Associate Professor, Department of Community Medicine, Grant Medical College, Mumbai

ABSTRACT

Background: Compliance to post-exposure vaccination is crucial to achieve optimum level of antibody titers. **The present study was planned to assess the compliance of 4 dose intradermal regimen over 5 dose intramuscular regimen. Objective:** To study adherence of patients to 4 dose regimen. **Methods:** Hospital record based study. Patients who attended Antirabies clinic from Jan 2010 to Dec 2010 were studied. 2051 patients who were given Inj. PCECV by intradermal route formed the study group. Pearson's Chi square test was used as a test of significance. **Result:** 2051 patients were studied. 1741 (84.9%) patients were male. 1907 (92.9%) were dog bites. 1277 (62.3%) were stray dog bites. 1516 (58.0%) were class III dog bites. 1313 (68.2%) were non-observable dog bites. 1711 (88.7%) were provoked dog bites. Most common site of dog bite was over the lower limb i.e. 1350 (70.2%). 1255 (65.3%) patients completed the 4 dose regimen. This in stark contrast to previous evidence from our centre in which a compliance of 40.2% to the intramuscular regimen was evident. (Pearson $\chi^2 = 180.94$, $df = 1$, $p < 0.0001$). **Conclusion:** It was observed intradermal regimen had more patient adherence compared to intramuscular regimen.

INTRODUCTION:

Rabies continues to be a major public health problem in our country. Although the actual number is not known, it is estimated that 17 million animal bite cases occur and 20,000 human deaths occur due to rabies each year in India. Based on vaccine utilization, approximately 3 million people receive post-exposure treatment in our country. ⁽¹⁾ Rabies is 100% fatal at the same time 100% preventable if managed appropriately and timely. Anti-Rabies treatment is based on local wound care and administration of appropriate Rabies biological as Rabies Immunoglobulin and Vaccines.

Though rabies is considered 100% fatal, it is preventable if the state of art modern prophylactic measures recommended by WHO are instituted soon after the exposure.

Previously in India, nervous tissue vaccines (NTV) were used mostly. But with the advent of modern cell culture vaccines, which are highly potent and safe, the post-exposure vaccination for rabies underwent a dramatic change with almost painless injections, much reduced doses over the deltoid region and negligible side effects, as NTV's were causing inherent neuromuscular side effects. But high cost and limited availability are the limiting factors for the wider use of CCVs. ⁽¹⁾

However, in India, as Semple (sheep brain) vaccine was widely used in Government hospitals till 2004 (till mid 2005 precisely) the shortage of rabies vaccine was not felt. But, now with the stoppage of Semple vaccine and the shortage of modern vaccines (due to budgeting constraints) is being increasingly felt. Consequently, it is now imperative to introduce IDR as a safer, ethical and cost effective replacement of Semple vaccine in Government hospitals. As this is new to India, judicious planning and proper implementation are needed for its success as it largely benefits the poor and needy who visit Government hospitals.

To overcome these problems, WHO recommended the use of Intradermal (ID) route of administration of CCVs, which not only reduces the cost of PEP, but also allow wide coverage in available quantity of vaccines.

After considering the recommendations of experts, results of clinical trials and international experience, Drug Controller

General of India (DCGI) approved the use of safe, efficacious and feasible ID route of administration of CCVs from February 2006. ⁽¹⁾

AIM: To study patient's adherence to intradermal antirabies vaccination.

OBJECTIVE:

To study adherence of patients to 4 dose intradermal regimen.

MATERIAL AND METHODS:

This was a hospital record based cross-sectional study. Patients who attended Anti rabies clinic from January to December 2010 were studied. 2051 patients who were given Anti Rabies Vaccination by intra dermal route formed the study group. For the purpose of comparison, 2007 data of the IM route has been used (n=1075). Statistical analysis is done by Pearson's Chi Square test.

RESULTS:

2051 patients were studied. 1741 (84.8%) patients were male and 310 (15.1%) patients were female. 1339 (65.3%) patients completed the 4 dose regimen and 712 (34.7%) patients not completed the 4 dose regimen. Out of which 101 patients taken only single dose, 264 patients taken 2 doses while 347 patients taken 3 doses of Intradermal Antirabies Vaccination. This in stark contrast to previous evidence from our centre in which a compliance of 40.2% to the intramuscular regimen was evident.

Table 1: Distribution of completion of ID Vaccination Schedule

Registered patients	Completed	Not completed
2051	1339 (65.3%)	712 (34.7%)

Total 2051 patients were registered during the year 2010 from January to December. Out of which 1339 (65.3%) patients completed the 4 dose regimen while 712 (34.7%) not completed the regimen.

Table 2: Compliance to ID vaccination by gender

Schedule	Completed	Not completed	Total
Male	1126 (64.7%)	615 (35.3%)	1741
Female	213 (68.7%)	97 (31.3%)	310

$\chi^2 = 1.89$, $df = 1$, $p = 0.17$ (NS); OR (95%CI) = 0.83 (0.64 - 1.09)

Compliance was seen more in female patients (68.7%) as compared to male patients (64.7%), but the difference was not statistically significant ($p=0.17$).

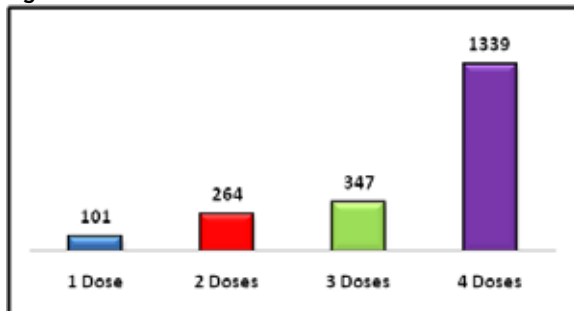
Table 3: Compliance to ID vaccination by age distribution

Age (Years)	Completed	Not completed
0 - 20	379 (64.6%)	208 (35.4%)
21 - 40 yrs	554 (64.1%)	311 (35.9%)
41- 60 yrs	321 (69.0%)	144 (31.0%)
61- 80 yrs	80 (63.0%)	47 (37.0%)
> 80 yrs	5 (71.4%)	2 (28.6%)

$\chi^2 = 4.01$, $df = 4$, $p = 0.41$ (NS)

Compliance to ID vaccination was observed more in above 80 years age group (71.4%) followed by 41-60 years age group (69%) and 0-20 years age group (64.6%), though the difference was not statistically significant ($p=0.41$).

Figure 1: Number of doses received



Out of 2051 patients, 1339 patients completed all the 4 doses, 347 patients took 3 doses, 264 patients received only 2 doses while 101 patients received only 1 dose of ID Anti Rabies Vaccine.

Table 4: Comparison of Compliance ID Vs IM vaccination schedule

Schedule	Completed	Not completed
ID	1339 (65.3%)	712 (34.7%)
IM	432 (40.2%)	643 (59.8%)

$\chi^2 = 180.94$, $df = 1$, $p = <0.0001$ (VHS), OR (95% CI) = 2.80 (2.40-3.27)

It was observed that compliance was observed more in intradermal (65.3%) vaccination schedule as compared to intramuscular (40.2%) vaccination schedule with very highly significant statistical difference.

DISCUSSION:

Compliance to post-exposure vaccination is crucial to achieve optimum level of antibody titers. Present study was planned to assess the compliance of 4 dose intradermal regimen over 5 dose intramuscular regimen.

The compliance to the ID regimen was found to be 65.3%, this is in stark contrast to previous evidence from our centre in which a compliance of 40.2% to the intramuscular regimen was observed. ($p < 0.0001$). Increased compliance to post-exposure vaccination may be due to the fewer number of visits to Anti-Rabies Clinic in case of ID regimen as compared to IM regimen. Enhanced compliance to the ID regimen is evident.

A month after the introduction of the new ID technique at the Shimla ID clinic, the hospital patient load had in-creased by 2.8 times.⁽⁵⁾

In India, IDRV was recommended for use in the government sector in 2006 and presently 12 states are administering this regimen.⁽⁶⁾ While administering the standard IM regimen, one of the major concerns is the requirement of repeated clinic visits by the patients which increases the cost of travel, more time spent and leading to lot of inconvenience. This reduces the compliance of the patients which may prove fatal in definite rabid exposures.⁽⁷⁾

It was also demonstrated by studies conducted at Thailand that the compliance for the intramuscular regimen is very low.⁽⁸⁾

CONCLUSION:

Increased compliance to post-exposure vaccination in case of ID regimen as compared to IM regimen. Intradermal regimen also reduces the number of vaccine vials used. Hence Intradermal regimen is more cost beneficial than Intramuscular (Essen) regimen.

REFERENCE

1. National Guidelines for Rabies Prophylaxis and Intradermal Administration of Cell Culture Rabies Vaccines, NICD, 2007. | 2. WHO expert consultation on rabies. First report. Geneva, World Health Organization, 2005 (WHO Technical Report Series No. 931. [Cited 2010 December 10]. Available from: <http://www.who.int/rabies/trs931> | 3. World Health Organization. Strategies For The Control And Elimination Of Rabies In Asia, Report of a WHO Interregional Consultation, 2001. | 4. Rahim A, Kuppaswamy K, Thomas B, Raphael L. Intradermal cell culture rabies vaccine: a cost effective option in antirabies treatment. Indian Journal Community Med, 2010;35:443-4. | 5. Bharti O K, Wim Van D, Kristof D, Petros I, An Appelmans, Ramachandran V, Phull A. Breaking the Barriers to Access a Low Cost Intra-Dermal Rabies Vaccine through Innovative "Pooling Strategy". World Journal of Vaccines, 2012, 2, 121-124 | 6. National Institute of communicable Diseases: National guidelines for rabies prophylaxis and intradermal administration of cell culture rabies vaccines, New Delhi 2007; 14. | 7. Mysore Kalappa Sudarshan, Doddabele Hanumanthaiiah Ashwath Narayana, Shampur Narayan Madhusudana, Ramesh Holla, Belludi Yajaman Ashwin, Bilagumba Gangabaraiah and Haradanahalli S. Ravish. Evaluation of a one week intradermal regimen for rabies post-exposure prophylaxis Results of a randomized, open label, active-controlled trial in healthy adult volunteers in India. Human Vaccines & Immunotherapeutics 8:8, 1077-1081; August 2012; c 2012 Landes Bioscience. | 8. Khawplod P, Wilde H, Sirikwin S, Benjawongkulchai M, Limusanno S, Jaijaroenab W, et al. Revision of the Thai Red Cross intradermal rabies post-exposure regimen by eliminating the 90-day booster injection. Vaccine 2006;24 (16):3084-6. |