Original Research Article

Effect of counselling on adherence to post-exposure anti-rabies vaccination schedule among patients attending anti-rabies clinic in a tertiary care hospital, Bengaluru, Karnataka, India

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ABSTRACT

Background: Rabies is 100% preventable disease. Complete post-exposure prophylaxis is necessary among the animal bite victims for complete protection. But it takes about 1 month to complete the schedule therefore drop-outs arise. Proper counselling can be given to make them adherent. Therefore this study is done to determine the compliance rate in two different groups with and without Information Education and Communication (IEC) material counselling and also to determine the constraints for compliance to anti-rabies vaccination (ARV).

Methods: A non-randomized trial was conducted in the anti-rabies clinic of Victoria Hospital, Bengaluru from March 1st to June 30th 2016. All the new cases were given routine oral counselling without IEC material during March and April month (Group I) and with IEC material during May and June month (Group II). The number of study subjects was 459 (169 + 290) after excluding those patients who could not be contacted through telephone, re-exposure and pre-exposure vaccination cases. Data was collected on record basis and through telephonic conversation. Descriptive statistics and chi-square test was used to analyze the data.

Results: 119 (70.4%) from group I (169) and 263 (90.7%) from group II (290) were compliant to complete course of ARV. Compliance rate had increased by 20.3% in Group-II.

Conclusions: Counselling with IEC material had made a significant impact on patient's attitude and behaviour thereby reducing drop-outs.

Keywords: Anti-rabies vaccination, Adherence, Counselling, Constraints

INTRODUCTION

Rabies is the 10th biggest cause of death due to infectious diseases worldwide.¹ Globally 61,000 deaths occur annually due to rabies, of which 16,450 (27%) occur in India.² Rabies is a vaccine preventable disease.³ Effective and complete post-exposure prophylaxis (PEP) can prevent the occurrence of rabies in an exposed individual.⁴ Every year, more than 15 million people worldwide receive a post-exposure vaccination. This is estimated to prevent hundreds of thousands of rabies deaths annually.¹ However, the incidence of rabies in

India is far higher than the rest of the world which can be attributed to patient's ignorance about the seriousness of the disease, and their failure to comply with the complete PEP regime.⁴

In India, Intradermal schedule (Updated Modified Thai Red Cross regimen) of rabies vaccination was implemented in 2006.¹ The Anti-Rabies Clinic in the Government Victoria Hospital attached to Bangalore Medical College and Research Institute [ARC-BMCRI], Bengaluru also provides this Intradermal Rabies Vaccination (IDRV) to animal bite victims since January

2015. The IDRV regimen requires 4 visits on 0, 3, 7 and 28th day over a period of 1 month. After the 1st dose on Day-0 the compliance of the patient's to next 3 doses were found to be low which can result in eventual development of rabies.⁴

Patient non-adherence can be a pervasive threat to health and wellbeing.⁵ The high drop-out rate can be attributed to the complex scheduling of subsequent doses where the patient does not remain in contact with the health care set up.⁴ If proper counselling was not given, then the patients often misunderstand, forget or ignore health care and they fail to follow the recommendations of the healthcare provider.⁵ To ascertain their cooperation to this complex and lengthy schedule it is important to educate and counsel the patient properly during the first visit itself when he is most receptive.⁴ Clear and effective communication between health professionals and their patients fosters greater patient satisfaction, reduces the risks of non-adherence and can improve patient's healthcare outcomes.⁵

This year 2016, there will be the celebration of 10th World rabies day on September 28 and the theme is Educate, Vaccinate and Eliminate rabies by 2030.⁶ As per the theme for education purpose we had tried this Information Education and Communication (IEC) material counselling for educating the patient's. Therefore this study aims to determine the compliance rate to complete course of IDRV in two different groups with and without IEC material counselling and also to determine the constraints for compliance among animal bite victims.

METHODS

A non-randomized trial was carried out at ARC-BMCRI, Bengaluru where patients were provided with IDRV (Updated Modified Thai Red Cross regimen) for PEP. This study was done for 4 months from March 1st to June 30th 2016. During this study period, the total number of patients attending anti-rabies out-patient clinic were 598 from which 459 patients were recruited for the study after excluding Pre-exposure cases, Re-exposure cases who gave clear history about their previous complete vaccination status and received only 2 doses, those patients who could not be contacted through telephone. Out of those 459 patients studied, 169 were studied during March and April month for whom routine oral counselling was given and we labelled them as group I. Then we prepared an IEC material regarding Prevention of Rabies in order to counsel the patient in various aspects such as PEP- IDRV schedule, importance of taking the vaccine doses on the scheduled days, follow up, how to overcome the various constraints etc.. in order to make them compliant to full course of ARV. Using that IEC material, during May and June month, counselling was given to 290 patients whom were labelled as group II. In both the groups, the counselling

was done before giving IDRV. For children, counselling was given to their parents.

The records maintained at ARC-BMCRI under Department of Community Medicine from the month of March to June 2016 were analyzed. On record basis, all relevant data such as socio-demographic profile of animal bite victims, details of exposure, status of the biting animal, time interval between the animal bite and patient reaching the hospital, categories of contact, number of ARV doses taken in the Victoria hospital and the number of ARV doses taken correctly at the stipulated dates were collected, total number of patients who did not complete their IDRV schedule and their telephone numbers. These baseline data was collected from the records and the remaining data collection was done through telephonic conversation.

The data collected was coded and entered in Microsoft Excel version 2007 and it was analyzed using SPSS version 17.0 software. Descriptive statistics and chi-square test was used for data analysis and the data was represented in the form of percentages. The results were presented in the form of charts, tables, figures wherever necessary.

RESULTS

Among 459 patients studied i.e.169 from Group I and 290 from Group II, 119 (70.4%) and 263 (90.7%) from both groups were compliant to full course of ARV.

Among the patients studied in both the groups, most of them belong to ≤ 15 years age group [66 (39.1%), 107 (36.9%)] and most of them were males constituting male: female ratio to 3:1. 151 (89.3%) and 248 (85.5%) were from urban areas, 115 (79.3%) and 187 (78.9%) were literates, 27 (29%) and 55 (33.7%) were skilled workers in both the groups (Table 1).

Figure 1 (A and B): Distribution as per biting animal.

In this study we observed that in both the groups, most of the animal bite victims were bitten by dog [164 (97%), 278 (95.9%)] (Figure 1). Among them 110 (67.1%) and 175 (62.9%) were bitten by stray dogs, remaining by pet

dogs. Among those pet dogs, only 13 (24.1%) and 48 (48.6%) were immunized in both the groups (Table 2).

Table 1: Socio-demographic profile of animal bite victims.

Age group (years)	n ₁ = 169 (%)	n ₂ = 290 (%)
<15	66 (39.1)	107 (36.9)
16-30	42 (24.8)	080 (27.6)
31-45	24 (14.2)	060 (20.7)
46-60	26 (15.4)	032 (11.0)
>60	11 (06.5)	011 (03.8)
Gender	n₁ = 169 (%)	n₂ = 290 (%)
Male	127 (75.1)	220 (75.9)
Female	042 (24.9)	070 (24.1)
Domicile	n₁ = 169 (%)	n₂ = 290 (%)
Urban	151 (89.3)	248 (85.5)
Rural	018 (10.7)	042 (14.5)
Education^a	G₁ = 145 (%)	G₂ = 237 (%)
Literate	115 (79.3)	187 (78.9)
Illiterate	030 (20.7)	050 (21.1)
Occupation^b	G₁ = 93 (%)	G₂ = 163 (%)
Profession	08 (08.6)	08 (04.9)
Semi – profession	01 (01.1)	03 (01.8)
Clerical, shop-owner, farmer	20 (21.5)	30 (18.5)
Skilled worker	27 (29.0)	55 (33.7)
Semi – skilled worker	08 (08.6)	16 (09.8)
Unskilled worker	22 (23.7)	33 (20.3)
Unemployed	07 (07.5)	18 (11.0)

^aThe number of children <7 years were 24 (G₁) and 53 (G₂), they were excluded; ^b66 (G₁), 107 (G₂) were children <15 years and 10 (G₁), 20 (G₂) were students, so 76 from n₁ and 127 from n₂ were excluded.

Table 2: Nature of the biting animal (dog).

Type of dog	G ₁ = 164 (%)	G ₂ = 278 (%)
Stray	110 (67.1)	175 (62.9)
Pet	054 (32.9)	103 (37.1)
Immunization of pet dog	G₁ = 54 (%)	G₂ = 103 (%)
Yes	13 (24.1)	48 (48.6)
No	41 (75.9)	55 (53.4)

Among those patients studied, most of them i.e. 108 (63.9%) from group I and 190 (65.5%) from group II reported for treatment within 24 hours of post-exposure (Table 3).

Table 3: Time interval between the animal bite and patient coming to the hospital.

Time interval	n ₁ = 169 (%)	n ₂ = 290 (%)
< 24 Hours	108 (63.9)	190 (65.5)
> 24 Hours	061 (36.1)	100 (34.5)

After exposure to the animal, physician categorizes the animal bite wound for further management based on WHO classification. Among the patients studied, 122 (72.2%) from group I and 164 (56.6%) from group II had category III exposure and rest of them had category II (Table 4).

Table 4: Categories of contact with suspect rabid animal.

Category	n ₁ = 169 (%)	n ₂ = 290 (%)
II	047 (27.8)	126 (43.4)
III	122 (72.2)	164 (56.6)

Out of the total 459 (169+290) patients studied, 323 (78+245) had taken all 4 doses of vaccines in the Victoria hospital. The telephonic conversation was done to collect the further information from the remaining patients which revealed that 59 (41+18) had taken all 4 doses in the outside hospital whereas others had not completed the course. So totally 119 (70.4%) from group I and 263 (90.7%) from group II were compliant to full course of ARV (Figure 2).

Figure 2 (A and B): Compliance to anti-rabies vaccination.

To test the association between counselling and compliance to ARV, chi-square test was used which showed the chi-square value to be 28 and two tailed 'p' value to be <0.0001 which was found to be extremely statistically significant (Table 5).

Table 5: Association between counselling and compliance to anti-rabies vaccination.

Variables	Group I	Group II	Total	'p' value is
Compliance	119	263	383	<0.0001
Drop-outs	050	027	076	
Total	169	290	459	

Two-tailed 'p' value is <0.0001 which is statistically significant.

Among those patients who had taken all 4 doses (119+263), 98 (82.4%) from group 1 and 257 (97.7%) from group 2 had taken the 4th dose on the scheduled dates whereas the remaining patients were delayed (Table 6).

Table 6: Punctuality of the animal bite victims receiving ARV on scheduled days.

Doses	G ₁ = 119 (%)	G ₂ = 263 (%)
1 st	119 (100.0)	263 (100.0)
2 nd	110 (92.4)	258 (98.1)
3 rd	104 (87.4)	260 (98.9)
4 th	098 (82.4)	257 (97.7)

Among those 77 (50±27) non-compliant patients from both the groups, further leading questions had been asked on the telephone and the constraints for their compliance had been found out. In group I, majority of them i.e. 9 (18%) had replied distance from the hospital, 8 (16%) had forgotten the dates, 7 (14%) had their own personal works whereas in group II, majority of them i.e. 20 (74.1%) had replied personal work as a constraint factor for their compliance (Table 7).

Table 7: Constraints for compliance to anti-rabies vaccination.

Constraints for compliance	G ₁ = 50 (%)	G ₂ = 27 (%)
Distance from the hospital	09 (18.0)	02 (07.4)
Forgotten the dates	08 (16.0)	02 (07.4)
Personal work	07 (14.0)	20 (74.1)
Went to hometown	06 (12.0)	01 (03.7)
Dog was fine	06 (12.0)	00 (00.0)
Timings not convenient	04 (08.0)	02 (07.4)
Did not feel it's needed	03 (06.0)	00 (00.0)
Cost incurred (travel charges)	02 (04.0)	00 (00.0)
Loss of wages	02 (04.0)	00 (00.0)
Cannot afford the cost	02 (04.0)	00 (00.0)
Herbal medicines	01 (02.0)	00 (00.0)

DISCUSSION

In the present study we observed that in both the groups, most of the patients (39.1%, 36.9%) were ≤15 years and nearly 75% of patients were males constituting male: female ratio to 3:1. Similarly in a study conducted by Chauhan P et al in Jodhpur, showed that 53.9% were children less than 15 years and 69.9% were males.⁷ Children were more exposed because they were unable to protect themselves. As the age advances, the number of cases decreases. Males were more exposed which may be attributed to their more outdoor activity. In this study, we also observed that most of the patients (89.3%, 85.5%) on both the groups were from urban area and 79% were literates. In a similar study conducted by Seenivasan P et al in Tamil Nadu, 82.1% were from urban area and 81.7% were literates.⁸ This could be due to the reason that as the study setting was on the tertiary care hospital and

both the studies were conducted on metropolitan cities like Bengaluru and Chennai where most of the people were urban and literates. In both the groups, most of them were skilled workers. These all findings indicate that the socio-demographic profile of animal bite victims on both the groups were almost the same thus it does not influence the results of the study.

In this study we noticed on both the groups that dog was the most common biting animal (97%, 95.9%). Similar findings were observed in other studies.^{1,7,9,10} We also observed that most of them (67.1%, 62.9%) were bitten by stray dogs and only few pet dogs (24.1%, 48.6%) were immunized which indicates poor vaccination even among pet animals. But compared to group I, the pet dog immunization was almost double on group II. These findings were consistent with the study conducted by Seenivasan et al in Tamil Nadu.⁸

In the present study, we observed that most of the animal bite victims (63.9%, 65.5%) on both the groups came to the hospital within 24 hours of post-exposure. So almost equal number of patients was aware about the management and came to the hospital. So it did not interfere with the study results. Only because of the counselling which was done on a different manner by using IEC material, the compliance rate had increased on Group-II. In this study, most (72.2%, 56.6%) of the patients had category III exposure in both the groups but compared to group I, in Group II it was lesser. As category III patients will have severe wound compared to category II, they tend to be more compliant. But here even though there was comparatively less number of category III patients in group II, the compliance rate was higher which showed the effectiveness of counselling by using IEC material. Similarly a study conducted by Chauhan P et al in Jodhpur also showed that 72.7% were category III cases.⁷ Similar observations were also observed by Sajna MV et al and sheetal V et al.^{1,9} This could be due to the fact that this study was done on a tertiary care hospital where most of the patients were referred for RIG.

In the present study, we observed that 70.4% were compliant to complete course of IDRV in group I. Similarly the studies done by Shankaraiah et al on Bangalore on 2012, Bariya et al on Gujarat on 2011 and Vinay et al on Mandya on 2012 showed the compliance rate to IDRV to be 77%, 70% and 53.2%.¹¹⁻¹³ But for group II for whom counselling was given by using IEC material, the compliance rate to complete course of IDRV was found to be 90.7%. Similarly a study done by Ali et al on Berhampur on 2012 showed the compliance rate to complete course of IDRV to be 91.3% on group I where routine counselling was given and 99.7% on group II where proper counselling was given based on the patients knowledge gap.⁴

In the present study, we found that 100%, 92.4%, 87.4% and 82.4% of patients in group I had taken their 1st, 2nd,

3rd and 4th dose on the scheduled days whereas on group II, 100%, 98.1%, 98.9% and 97.7% had taken their respective doses on their scheduled days. This showed that after giving counselling by using IEC material the percentage of patients taking their respective doses on their scheduled days had been increased dramatically. On the other hand, as the dose increases the percentage of patients who had taken their doses on scheduled days had been decreased whereas there was only little variation in group II which showed that even the dose increases, the punctuality remained the same among group II patients which was the good impact of counselling by IEC material. Once the patient was late, again the counselling was given on that respective visit regarding the vaccination schedule. Similarly a study done by Ali et al on Berhampur on 2012 showed that 10.7% were delayed for their respective doses on group I whereas only 3.7% were delayed in group II.⁴

In the present study, the major constraints for compliance was found out to be distance from the hospital (18%), forgotten the dates (16%), personal work (14%) on group I whereas most of them (74.1%) replied personal work i.e. family functions, relatives admitted on the hospital, went to relatives place where there was no nearby hospital as their constraint factor on group II. Similarly Ali et al also observed in their study that personal work (98%) was the major constraint factor on group II.⁴ One more study done by Bariya et al in Gujarat in 2011 showed the constraint factor to be personal or official workload, patients had forgotten the scheduled dates of vaccination.¹² Regarding the personal work issues, we need to counsel them effectively by saying their life is more important than their personal work and make them compliant to IDRV, so this part need to be added in more detail in IEC material which we decided to do by seeing this constraint factor in group II. One more important finding we noted was there was no such constraints like dog was fine, cost incurred, loss of wages etc on group II which was due to the fact that we had given them counselling by using IEC material specially on those facts which make them non-compliant.

Limitations

Total number of study subjects varies between the 2 groups (greater on group II). Telephonic conversation was conducted to estimate the compliance rate to IDRV, on which 95 [(60 (G₁) + 35 (G₂))] patients had not responded, whose vaccination status was unknown so those were excluded. If they would have responded, compliance rate may vary.

Recommendations

Counselling with IEC material can be included as a part of management process to achieve the Human health- a part of One Health Challenge for eliminating rabies worldwide in 2030.

CONCLUSION

Counselling with IEC material had made a significant impact on patient's attitude and behaviour thereby improving the compliance of the patient in completing the PEP-IDRV schedule and many major constraints became minor constraints which were considered to be good for this highly fatal disease.

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