Title: FACTORS INFLUENCING INRA-ANNUAL VARIATION IN THE NUMBER OF ANIMAL BITE CASES AMONG CHILDREN AGED LESS THAN 15 YEARS OF AGE ATTENDING ANTI RABIES CLINIC IN MANDYA CITY

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Keywords Animal bite, children, monthly variations, school holidays

Abstract Rabies is an acute viral encephalitis which is virtually 100% fatal. Rabies is mainly transmitted by animal bites, mostly dogs in the Indian context. 40% of those who get post exposure prophylaxis are children aged less than 15 years. The number of animal bite cases a month children aged less than 15 years varies over different periods of the year. The present study was undertaken to analyse the factors responsible for these variations.

Original Article

Factors influencing Intra-annual variation in the number of animal bite cases among children aged less than 15 years of age attending Anti Rabies Clinic in Mandya city

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Abstract

Introduction: Rabies is an acute viral encephalitis which is virtually 100% fatal. Rabies is mainly transmitted by animal bites, mostly dogs in the Indian context. 40% of those who get post exposure prophylaxis are children aged less than 15 years. The number of animal bite cases among children aged less than 15 years varies over different periods of the year. The present study was undertaken to analyse the factors responsible for these variations.

Objectives: To determine the intra annual variation in the number of children aged less than 15 years attending the Anti Rabies Clinic in Mandya Institute of Medical Sciences Hospital, Mandya, Karnataka state (ARC-MIMS) and to determine factors responsible for the variation.

Materials & Methods: The records of all the 5,838 animal bite cases among children aged less than 15 years who reported to ARC-MIMS from January 2008 to December 2011 (a period of 4 years) were analyzed using Epiinfo software.

Results: The monthly average of animal bite cases among children aged less than 15 years reporting to ARC-MIMS during the 4 year period was 486.5. The standard deviation was 59.9. Intra-annual (monthly) variation was found in the total children population and among age group of 5-10 years, males, rural residents, persons exposed to dogs, persons exposed to pets & non pets and persons whose exposure was provoked. A significantly more number of children attended ARC-MIMS during school holidays especially with exposure to pets.

Key words: animal bite, children, monthly variation, school holidays

Introduction

Rabies is an acute viral encephalitic, zoonosis. The disease affects domestic and wild animals, and is spread to people through close contact with infected saliva.[1]

One of the important routes of rabies transmission to humans is the bite of rabid animals (dog in the Indian context). Most of the deaths occur in the absence of post-exposure prophylaxis. Rabies is virtually 100% fatal. Although Rabies is a vaccine-preventable disease, it still poses a significant public health problem in many countries in Asia and Africa where 95% of the 55,000 human deaths occur. This is the situation even though safe, effective vaccines for both human and veterinary use exist. Nearly half of those bitten by suspect rabid animals are children under 15 years of age.[2]

Although all age groups are susceptible, rabies is most common in people younger than 15 years; on an average 40% of the post-exposure prophylaxis given in Asia and Africa are to children aged 5–14 years, and the majority receiving the PEP are male.[3] In India, about 17.4 million people are bitten by animals, mostly dogs, every year and need postexposure prophylaxis. In India 20,000 people die every year due to rabies.[4]

There is a significant variation in the number of people getting bitten at different times of the year.[5] This study explores the variation in the number of children aged less than 15 years getting bitten in different times of the year and some of the factors affecting it.

Objectives

The present study was conducted with the following objectives

1. To determine the variation in the number of children aged less than 15 years attending the Anti Rabies Clinic in Mandya Institute of Medical Sciences Hospital, Mandya, Karnataka state (ARC-MIMS)

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Table 1:
Year and month wise distribution of number of animal exposure victims

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2008	160	139	138	153	120	96	105	107	96	102	128	133	1477
2009	128	101	96	156	141	106	83	122	120	103	121	112	1389
2010	137	124	124	127	142	122	77	112	119	124	141	143	1492
2011	154	136	134	122	127	122	98	96	107	135	137	112	1480
Total	579	500	492	558	530	446	363	437	442	464	527	500	5838

2. To determine the factors affecting the variation in the number of children aged less than 15 years attending ARC-MIMS

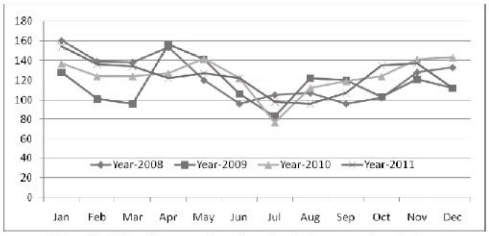
Materials And Methods

This study is a cross sectional retrospective record based study. The case records of all the children aged less than or equal to 15 years who had attended ARC-MIMS between 1st January 2008 and 31st December 2011, a 4 year period were analyzed using Epiinfo software.

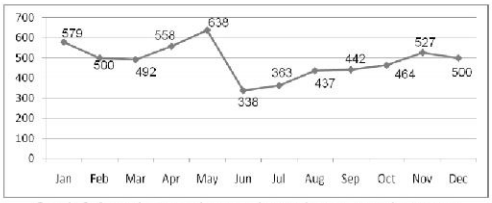
Results

A total of 17,281 animal exposure victims reported to ARC-MIMS between 1st January 2008 and 31st December 2011, a 4 year period. Of these 5,838 (33.78%) were aged less than or equal to 15 years of age. The month wise distribution of the victims is given in table 1.

Of the 5,838 children aged less than or equal to 15 years of age 4,142 (70.9%) were male. 4,330 (74.2%) were from rural areas. 2,031 (34.8%) were aged less than 5 years, 2,081(35.6%) were aged 5 to 10 years and 1,726 (29.6%) 10 to 15 years. 4,023 (68.9%) were currently attending school. 4,705 (80.6%) gave a history of provoked bites and 1,133 (19.4%) of unprovoked bites.



Graph1: Line diagram showing the intra-annual variation



Graph 2: Line digrame showing the total intra-annual variation of 4 years (2008-2011)

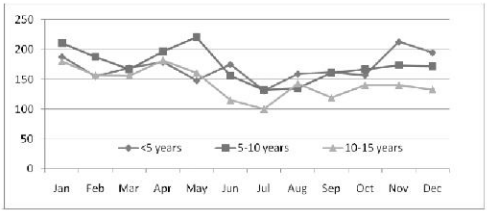
Table 2
Month wise distribution of number of animal exposure victims

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
<5 years	188	155	169	179	148	175	131	159	162	157	213	195	2031
5-10 years	211	188	167	197	221	156	132	135	161	167	174	172	2081
10-15 years	180	157	156	182	161	115	100	143	119	140	140	133	1726
Male	408	358	356	416	366	326	258	307	308	339	359	341	4142
Female	171	142	136	142	164	120	105	130	134	125	168	159	1696
Urban	447	373	362	378	382	323	275	315	328	355	396	396	4330
Rural	132	127	130	180	148	123	88	122	114	109	131	104	1508
Dog	533	523	491	552	519	434	352	423	437	454	510	493	5721
Others	6	13	4	7	10	12	9	17	6	10	12	11	117
Pet	284	256	283	307	302	230	165	210	227	241	228	228	2961
Non-Pet	295	244	209	251	228	216	198	227	215	223	299	272	2877
Provoked	484	408	393	402	416	354	281	364	354	393	440	416	4705
Unprovoked	95	92	99	156	114	92	82	73	88	71	87	84	1133

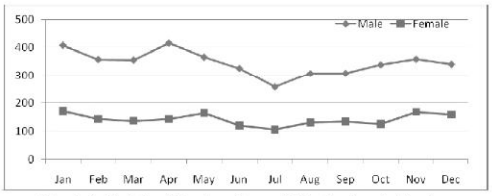
The Graph 1 shows the annual trends of animal bites that reported to the ARC MIMS during the study period.

The graph 2 shows the monthly case load during the study period at the ARC MIMS and it is evident that the peak was in the months of April – May (graphs 1 and 2)

The average number of cases per month in 2008 was 123.08 $\pm$ 22.1. It was 115.75 + 20.1in 2009, 124.3 $\pm$ 17.9 in 2010 and 123.3 $\pm$ 17.4 in 2011. The average number of cases per month for the 4 year period was 486.5 $\pm$ 59.8. In the month wise total of the 4 years more number of cases were found in January, April, May and November. Less number of cases were recorded in the months of July, August and September. The distribution of the cases is given in table 2

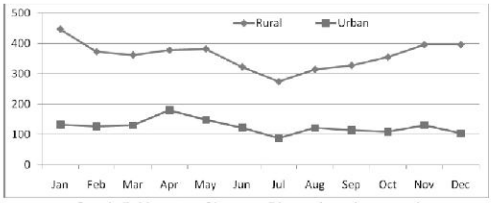


Graph 3: Variation Showing Age and Month wise distribution

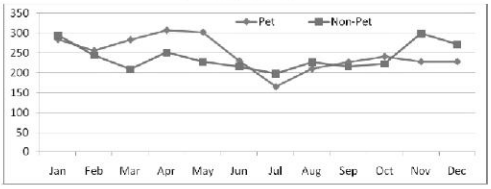


Graph 4: Variation Showing Sex and Month wise distribution

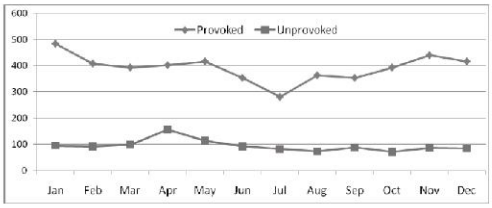
The age wise distribution of the cases of the 4 years showed that 34.8% were aged below 5 years, 35.6% were 5 to 10 years and 29.4% were 10-15 years. The average number of cases in those aged less than 5 years was 169.25 $\pm$ 22.3. It was 173.4 $\pm$ 27.3 for 5 to 10 years and 143.8 $\pm$ 25.1 for 10 to 15 years. The difference in the standard deviation was found to be significant. (p=0.0027) the details are shown in graphs 3 to 7.



Graph 5: Variation Showing Place of residence and Month wise distribution



Graph 6: Variation Showing Status of Animal and Month wise distribution



Graph 7: Variation Showing Provocation of animal and Month wise distribution

70.9% of the exposed victims were males and 29.1% were females. The average number of cases in males was 345.17 $\pm$ 43.4. It was 141.33 $\pm$ 20.61 for females. The difference in the standard deviation was found to be not significant. (p=0.41)

74.2% were from rural area and 25.8% were from urban area. The average number of cases from rural residence was 360.83 $\pm$ 45.53. It was 125.67 $\pm$ 23.08 for urban residents. The difference in the standard deviation was found to be significant. (p=0.0054)

Table 3
Month wise distribution of school going children exposed to animal bites.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
454	404	372	443	394	293	258	312	306	258	274	255	4023

\ Chi Square Value =291.42; d.f= 11and P Value = 0.0001

98.0% were exposed to dogs; the monthly average was 476.67 ± 57.76%. 2.0% were exposed to other animals, and the monthly average was 9.75 ± 3.6. The difference in the standard deviation was found to be not significant. (p=0.15)

50.7% were exposed to pets and 49.3% were exposed to other community owned or stray animals. The average number of cases exposed to pets was 246.75 ± 41.46. It was 239.75 ± 33.3 for non pets. The difference in the standard deviation was found to be significant. (p=0.001)

80.6% reported provoked exposure and 19.4% reported unprovoked exposure. The average number of cases reporting provoked exposure was 392.1 ± 50.7. It was 94.4 ± 22.5 for non provoked exposures. The difference in the standard deviation was found to be significant. (p<0.0001)

Of the total 5,838 aged less than or equal to 15 years of age who attended ARC-MIMS in the 4 year period, 4023 (%) were attending school.

The average number of cases was 335.25 ± 74.19. More cases were found in January, April and February. Less number of cases was found in December, October and July.

The period of school holidays was obtained from the Deputy Director of Public Instruction office of Mandya. The average number of cases during this period was 365 ± 95.84. The average number of cases during the period when the school was functioning was 325.33 ± 64.49. There was significantly more number of cases during the holidays as compared to the time when the school was functioning.

Conclusion

The number of animal exposure cases among children aged less than or equal to 15 years reporting to ARC-MIMS, varies from month to month, this is consistent during all the 4 years of the study period. More number of cases were seen between November and May. Significantly more children reported to ARC-MIMS during their school holidays.

Similar studies have shown more cases in October-February[5], January-February[6] and during summer[7].

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