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The Prevalence of Rabies and Animal Bites in Mosul City (Iraq)

Dr. Arif Taha Abbo Almawla D.M[1], Dr. Muhialdeen Mohammed Ahmed[2], Dr. Raghad A. Ibrahim CABM- FM[3], Dr. Salman Isa Hasa FIBMS[4], Salih Sulaiman Mahmood D.M [5]

[1]Directorate of Nineveh Health Aljumhory Hospital, Mosul, Iraq
[2]Directorate of Nineveh Health, Ibn-Sina Hospital, Mosul, Iraq
[3,5]Directorate of Nineveh Health, Alshiffa Hospital, Mosul, Iraq
[4]Directorate of Nineveh Health, Neurology Alsalam Hospital, Mosul, Iraq

ABSTRACT

Background: Rabies is an acute viral disease of the central nervous system (CNS) that is transmitted to humans by infected animals. After a prodromal phase, rabies manifests most often as encephalitis or less frequently as a paralytic form of the disease progress to coma and death.

Objective: To estimate the frequency of rabies and animal bites among the population in Nineveh governorate and to estimate the differences in gender and ages among rabid patients and bitten people.

Methods: 1- prospective study was carried out on (9) cases of rabid patients of both sexes where admitted in Alshifaa Hospital (Mosul city) for chest and infectious disease from the first January on 2011 to the last of December on 2018. 2- Also a prospective study was carried out on (800) cases of animal bites who admitted to the hospital for treatment for pre exposure prophylaxis of rabies from the first of April 2018 to the last of January on 2019.

Results: Shows the rabies is more common in males than females and more common in adolescences and adults.Also, the study shows that the most of bitten people is caused by dogs (aloose or owned dogs) more than other animals.

Conclusion: Rabies is fatal disease, but it is preventable and since incubation period of rabies is prolong so post exposure prophylaxis should still be considered even if the interval from exposure is prolong.Also since the most bites of animals were caused by dogs, so that every effort should be done to decrease the number of bites on exposed peoples especially children.

Keywords: CNS (Central nervous system), HRIG (human rabies immunoglobulin), PEP (Pre-exposure prophylaxis)

INTRODUCTION

Rabies is an acute viral disease of the CNS which is fatal that is transmitted to humans by infected animals [1]. After a prodromal phase, rabies manifests most often as encephalitis or less frequently as a paralytic form of the disease progress to coma and death [1]. Rabies is caused by rhabdovirus that infects the CNS and salivary glands of a wide range of mammals and usually conveyed by saliva through bites or licks on abrasions or intact mucous membrane[1, 2].

The animals which transmit rabies like dogs, cats, cows, buffaloes, sheep and goats, pigs, donkeys,horses, camels, foxes, jackals, monkeys, mongoose, bears, raccoons,and bats. But there is no reported cases of rabies caused by bitten of rodents, birds,and squirrel [3].Rabies is commonly transmitted by bites from infected animals or licks on broken skin or mucous membrane or by scratches[1,2,3,4]. But rare mode of transmission is by inhalation, organ transplantation, ingestion or sexual. The incubation period of rabies is a few days to several years most cases become apparent after (1-3 months)[3,4].In one study approximately (4-10 %) of cases had an incubation period of (6) months or more.

Clinical features

Two acute neurological forms of rabies are seen in humans

1) Encephalitic (Furious) form which seen in about (80%) of cases
2) Paralytic (dumb) in (20 %) of cases [2,3,4].

In encephalitic phase the onset may start as fever, paresthesia at the site of the bite, after prodromal period of (1-10) days during which the patients becomes increasingly anxious, leads to the characteristic hydrophobia, although the patient is thirsty, attempts at drinking provoke violent contractions of the diaphragm and other inspiratory muscles, delusions and hallucinations may develop, accompanied by spitting, biting, and mania [1,2,3,4], with lucid intervals in which the patient is markedly anxious, cranial nerve lesions develop and terminal hyperpyrexia is common, death ensues usually within a week of the onset of the symptoms.

Paralytic rabies: for unknown reasons muscle weakness predominates and cardinal features of encephalitic rabies (Hydrophobia, aerophobia, fluctuating consciousness) are lacking in ~ 20 % of rabid cases, paralytic rabies is characterized by early and a prominent muscle weakness often beginning in the bitten extremity and spreading to produce quadriparesis and facial weakness[2,3,4].

Treatment

There is no established treatment for rabies but it is preventable[1,2,3,4,5,6], aggressive management with supportive care in critical care unit has resulted in survival of more than (15) patients with rabies. But all of them received one or more doses of rabies vaccine before disease onset [1].

Prevention

Rabies is preventable disease[1,2,3,4,5,6], and prevention can be divided into two categories:

1- Postexposure prophylaxis (PEP): the physician must decide whether initiation of PEP is warranted. Healthy dogs, cats, or ferrets may be confined and observed for 10 days. PEP is not necessary if the animal remains healthy. If the animal develops signs of rabies during the observation period, it should be euthanized immediately. The head should be transported to the laboratory under refrigeration, rabies virus should be sought Direct Fluorescent Antibody Testing, and viral isolation should be attempted by cell culture and/or mouse inoculation, if the laboratory results proved to be negative,It may safely be concluded that the animals' saliva did not contain rabies virus, and immunization should be discontinued, if an animal escapes after an exposure it must considered rabid and PEP must be initiated. PEP includes local wound care and both active and passive immunization. All bite wound and scratches should be washed thoroughly with soap and water. Devitalized tissues should be debrided and disinfected by povidone iodine, spirit, household antiseptic, tetanus prophylaxis given, and antibiotics treatment initiated whenever indicated [1,2,3,4]. Avoid suturing of the wounds and suturing only if required (1-2 loose sutures) and only after administration of HRIGs[1,2,3,4,5]. All previously unvaccinated persons (but not those who have previously been immunized) should be passively immunized with rabies immune globin (RIG). If RIG is not immediately available, it should be administrated no later than 7 days after the first vaccine dose. After day 7, endogenous antibodies are being produced, and passive immunization may actually be counterproductive. The dose of RIG (20 IU/kg) should be infiltrated at the site of bite, and any RIG remaining after infiltration of the bite site should be administered IM (Intra muscularly) at a distant site. With multiple or large wound the RIG preparation may need to be diluted in order to obtain a sufficient volume for adequate infiltration of all wound sites. If the exposure involves a mucous membrane, the entire dose should be administered IM. Rabies vaccine and RIG should never be administered at the same site or with the same syringe[1,2,3,4,5,6]. Four (1-mL doses) of rabies vaccine should be given IM in the deltoid area (The anterolateral aspect of the thigh also is acceptable in children.) Gluteal injections, which may not always reach muscle, should not be given and have been associated with rare vaccine failures. Ideally, the first dose should be given as soon possible after exposure without any delay. The three additional doses should be given on days 3, 7, and 14; a fifth dose on day 28 is no longer recommended[1].

   But WHO guideline for treatment of preexposure vaccination give fifth dose on the day 28[3].

2- Preexposure rabies vaccination: Preexposure rabies prophylaxis should be considered for people at a higher risk of exposure like dogs' handlers, veterinary surgeon's. The schedule consist of three doses of rabies vaccine given on days (0, 7, and 21 or 28). When a previously immunized individual is exposed to rabies, two booster doses of vaccine should be administered on days 0 and 3. Wound care remains essential as stated above. RIG should not be administered to previously vaccinated persons[1].

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METHODS AND MATERIALS

1- A prospective study was done in Al-Shiffa hospital on (9) cases of rabid patients of both sexes from January 1st, 2011 to the end of December on 2018.(9) cases of rabid patients were admitted to the hospital with history of dog bite they were examined thoroughly and all of them had rabies clinically, all the patients died within (10) days from the beginning of symptoms and signs of rabies.

Table 1: shows the distribution of the rabid patients those died from rabies

	Less than 1 year		1-4 year		5-9 year		10-14 year		15-19 year		20-44 year		45-64 year		65 and more		Vaccination status before exposure to animal bite
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	Not vaccinated
2011							1				1				1		Not vaccinated
2012					1												Not vaccinated
2013																	Not vaccinated
2014																	Not vaccinated
2015			1														Not vaccinated
2016						1			2								Not vaccinated
2017																	Not vaccinated
2018							1										Not vaccinated

2- Also prospective study was done on (800) cases how attend to hospital complaining of exposure to animal bites from first of April on 2018 to the end of January on 2019.

Table2: shows the number of cases which were bitten by animals and type of each animal and their percentages from first of April on 2018 to the end of January on 2019.

Type of animal	Number of cases which bitten by animals	Percentage
Dogs	778	97.25%
Cats	19	2.375%
Foxes	1	0.125%
Wolves	1	0.125%
Donkeys	1	0.125%
Total number	800	100%

Table 3: Shows the type of Dogs which cause the bites

Type of dog	Number
Owned dog	476
Loose dog	302
Total number	**778**

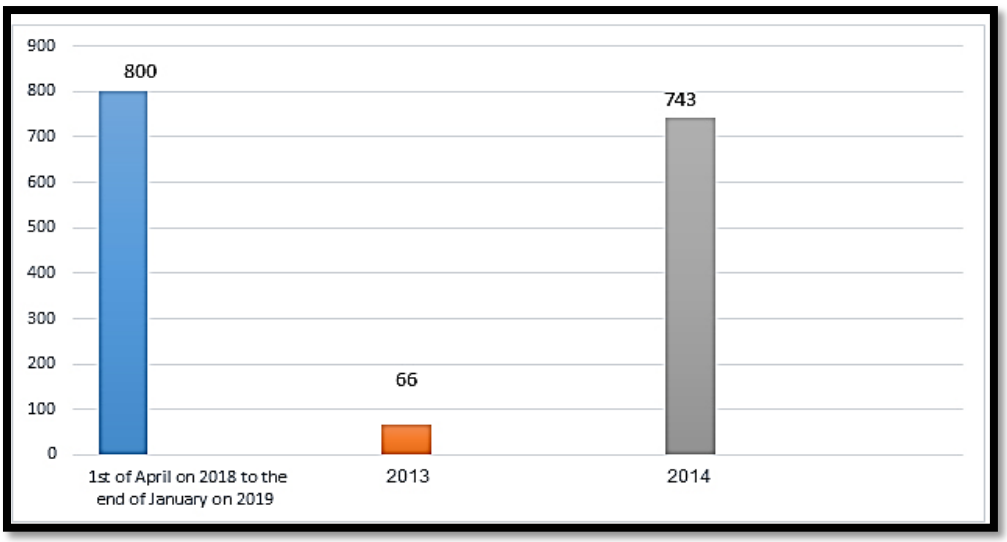

Figure 1: Shows the comparison of animal bites in (10) months from April 1st on 2018 to the end of January on 2019 to the animal bites in 2013 and 2014

RESULTS

1. Be outof 9 cases of the rabid patients who admitted to the hospital from first of January on 2011 to the last of December 2018 who were exposed to dogs bites of different intervals where died within (10) days after the appearance of symptoms and signs of rabies, and all of them had no history of vaccination (pre and post exposure prophylaxis) against animals bites which conveyed rabies. And the studyalso shows that rabies is more common in males than females and most of the rabid patients were adolescents and adults.

2. Also the study shows that most of the animal bites in the period between first of April 2018 to the last of January 2019 where caused by dogs bites (778) cases from the total number of animals bites (800) cases which constitute (97.25%) from the total number of animal bites, also the study shows other bitten animals like cats (19) case from the total number (800) cases which constitute (2.375%), foxes (one) from the total number (800) cases percentage (0.125%), wolves (one) case from the total number (800) cases which constitute (0.125%), donkeys (one) case from the total number (800) cases which constitute (0.125%)from the total number (800) cases.

DISCUSSION

In this study the total number of rabid patients (9) cases and because of the rabies is preventable disease, so that, if those patients received post-exposure vaccination (after animal bite) it is certainly will be protected from rabies and their lives would be saved. Also the study revealed that most of the animal bites were caused by dogs specially the owned dogs, so that, all protective measures for prophylaxes of rabies should be done. Also the study revealed a less number of animal bites wason 2014 (743) cases and the least number on 2013 (65) cases. The difference in the figure may be attributed to the good and restrict measure for controlling animal bites specially dogs like killing of a loose dogs (euthanized) which lived outside the houses and farms. Also a least figures of animal bites on (2013) may be because of good handling with animals especially dogs in comparison to the high figures of animals bites on (2018 – 2019). This high number may be attributed partially to the inefficient measures which done for controlling animal bites and lastly this high figure (2018-2019) may be partially related to the increasing number of animals.

CONCLUSION

Rabies is fatal disease , but it is preventable and since incubation period of rabies is prolong so post exposure prophylaxis should still be considered even if the interval from exposure is prolong .

RECOMMENDATIONS

1- Every person who exposed to a bitten animal who transmit rabies virus should attend hospital and took rabies vaccine according to the schedule.
2- Every effort should be done to control rabies in animals by use of baits containing rabies vaccine.
3- Also ones should treat the dogs with all respect.
4- Also to avoid disturbing a dog that is sleeping,eating,feeding.
5- To avoid shouting or running in the presence of a dog and not to play with unfamiliar dogs.
6- Every animal specially the domestic one should be treated with all respect and gently.

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