EPIDEMIOLOGICAL TRENDS, CLINICAL PROFILE AND GEOGRAPHICAL DISTRIBUTION OF CRIMEAN CONGO HEMORRHAGIC FEVER IN QUETTA, BALOCHISTAN.

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ABSTRACT: The main objective of this study was to determine the epidemiological trends, clinical profile and geographical distribution associated with Crimean Congo Hemorrhagic Fever in Quetta, Balochistan. Data from 2007 to 2010 were collected from public hospitals of Quetta i.e. Sandamen Civil hospital, Fatima Jinnah General and Chest hospital and Bolan medical complex.During the period of 2007-2010, total 101 cases were reported of CCHF, 83 patients were male and 18 were female. Mean platelet count for male and female patients was 45072.29 ± 35934.14 and 35388.89 ± 18081.96 respectively.The highest numbers of cases were from Quetta i.e. 36, 32 from Afghanistan. The occupation included, 69 Labor, 7 House Wife, 6 Students, 5 Butcher, 3 Sheppard, 2 Farmer, 2 Drivers, 2 Business man, 1 Tailor master, 1 Shop Keeper, 1 Mechanic, 1 House worker and 1 Health worker. In the year 2007, 2008, 2009 and 2010 total 32 (31.68%), 24 (23.76%), 22 (21.78%), and 23 (22.77%) cases were reported respectively. 21 died and the remaining patients discharged/survived. Out of 101 patients, sixty two had animals at their home. Crimean Congo Hemorrhagic Fever is a fatal and endemic infection in Quetta and other parts of province. It requires serious efforts from the healthcare community for its control and eradication

Key words: Descriptive epidemiology, Trends, Hemorrhagic, Fatal, Endemic.

INTRODUCTION

Crimean Congo Hemorrhagic Fever (CCHF) is caused by the Nairovirus of the Bunyaviridae family. The disease was first described in Crimea during 1944 and virus identified in 1956 in Congo and thus developed the current name for the disease as Crimean Congo Hemorrhagic Fever. It is transmitted to humans either by the bite of the *Hyalommamarginatum* tick or by direct contact through blood of an infected animal. Human CCHF is a peracute disease with a wide range of case fatality rate (Mardani *et al*., 2007). In Pakistan Crimean Congo Hemorrhagic Fever was first reported in Rawalpindi district during winter month of 1976, since then the number of cases has shown a trend of dramatic rise, annually in Pakistan. Although outbreaks of Crimean Congo Hemorrhagic Fever in Pakistan have classically occurred in rural Balochistan, CCHF cases have also occurred in Karachi in recent times. CCHF cases in Pakistan have mainly occurred in the months of October and November. This time period roughly corresponds to the Islamic festival of Eid-ul-Azha, celebrated on days 10 to 12 of the last month of each lunar calendar year, when large flocks of scarified animals are brought into the cities from the rural areas of Pakistan (Ali *et al*., 2010)

The occupational group like dairy farmers, butchers, veterinarians and health care workers are at the highest risk to acquire this infection. In tick infested areas, cases also occur among healthcare workers and other close in contacts taking care of the infected persons not practicing adequate infection control precautions. Person to person transmission through contact with skin, mucous membranes and body fluids of infected patients including blood, saliva, vomitus, urine, stool and semen is possible (Gonen 2011).

MATERIALS AND METHODS

Descriptive epidemiology of Crimean Congo Hemorrhagic Fever (CCHF) in the patients of Quetta, Balochistan was studied with reference to epidemiological trends, clinical profile and geographical distribution. The data of year 2007 to 2010 were collected from public hospitals of Quetta i.e. Sandamen Civil hospital, Fatima Jinnah General and Chest hospital and Bolan medical complex. Epidemiological trends were recorded from the data which included the patron of disease occurrence throughout the year, and month in which the disease outbreak was at high level. Clinical profile was recorded, included, mean platelet count, hemoglobin level, anti-CCHF antibodies, blood groups and outcome of CCHF patients. Similarly the geographical distribution was recorded from the data which included distribution of the disease in different areas of Balochistan. The patients included in the studies were on the basis of clinical signs, platelets counts and confirmatory report from NIH Islamabad. SPSS 16.0 was used to analyze the data. Quantitative data was presented with the help of Mean ± S.D. Qualitative data was

presented in form of tables, bar charts and graphs. Chi-square test was used to see the association with other related variables, and p-value<0.05 was taken as significant (Statistical Package for the Social Sciences, version 16).

RESULTS AND DISCUSSION

During the period of 2007-2010, total 101 cases were reported of CHHF. Among the reported cases 83 patients were male and 18 were female (Table#1). Mean age for male patients was 30.83±15.47 years, while for female patients mean age was 29.17±16.40 years. According to p-value (0.685) no significant difference was present among the age of male and female patients. The same findings were made by Sheikh *et al.,* (2005) and Saleem*et al.,* (2010) who reported that mean age of CCHF affected male and female patients as 33.5 ± 18.7 years and 31 ± 31.1 respectively. While Mustafa *et al.,* (2008) study shows that mean age was 50 years.

Mean platelet count for male and female patients was 45072.29±35934.14 and 35388.89±18081.96 respectively. According to p-value (0.270) no significant difference was present in the platelet count of male and female patients.The mean platelet count of CCHF patients was 47.569×10 9/l in non-fatal cases and 12.636×10 9/l in fatal cases (p=0.003) (Cevik *et al.,* 2008). Mean value of the hematological parameter of patients i.e. platelet count at the time of admission was 40.5±29.8×10 9/l (Saleem *et al.,* 2010). The laboratory investigations of patients with CCHF for platelet count is 27.1±15.6×10 9/l, this was determined by the study of Sheikh *et al.,* (2005).

Mean hemoglobin level for a male and female patient was 11.52±2.78 and 9.80±3.23 respectively. In terms of p-value significant difference was observed in the hemoglobin level of male and female patients. Female patients had less hemoglobin level as compared to male patients. i.e. (p-value=0.023) (Table#1).The mean value of hemoglobin of 12 sporadic cases of Crimean-Congo Hemorrhagic Fever was 11.1±3.3 g/dl (Saleem *et al.,* 2010).

Table-1: Descriptive Statistic for Age (Years), Platelet Count &Hb Level of reported cases of CHHF

	Age		Platelet Count		Hb Level	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**
n	**83**	**18**	**83**	**18**	**83**	**18**
Mean	30.82	29.17	45072.29	35388.89	11.52	9.80
SD	15.47	16.40	35934.14	18081.96	2.78	3.23
Minimum	8	5	10000	10000	4.20	4.70
Maximum	80	70	310000	76000	17.50	15.20
p-value	**0.685**		**0.270**		**0.023**	

(SPSS, version 16.0)

Residential location with respect to gender was determined. The total numbers of CCHF cases were 101, in which 83 were male and 18 were female. The highest numbers of cases were from Quetta i.e. 36, and 32 cases from Afghanistan, 7 cases from Loralai, 5 cases from Pasheen and Chaman, 4 cases from Killa-Saifullah, 2 cases from Zhob and Mastung, and 1 case each from Ziarat, Noshki, Mangocher, Kuchlaq, Kharan, Khanozai, Gulistan and DI Khan.Two hospital paramedics and five members died of the same family living in a region that borders on Afghanistan, which is also a CCHF-endemic country. Since June, a similar outbreak in Afghanistan has affected 27 people of whom 16 died (Kabir2000).

Occupational status with respect to gender was determined, the highest number of cases reported that they do labor work i.e. 69, in which 60 were male and 9 were female. The cases distributions for male were as followed, tailor master (1), student (5), shop keeper (1),

Sheppard (3), mechanic (1), health worker (1), farmer (2), driver (2), butcher (5), and business man (2). Similarly cases distribution for female was as followed, student (1), House worker (1), and House Wife (7). This concludes that as according to occupation, labors are more prone to CCHF both in male and female. Similarly Sheppard, butcher and health worker are also prone to CCHF. According to p-value a significant association exists between occupational status with respect to gender of the patients who suffered from CCHF fever (Table#3).The findings of Saleem *et al.,* (2010) of occupational status with respect to gender, who reported that 12 cases of Crimean Congo Hemorrhagic Fever were encountered at a tertiary care teaching hospital in Karachi, Pakistan between January, 2001 and October, 2009. After confirm diagnosis from serum sample of 12 patients were male. There were 1 case of Shepherd, 1 was a laboratory technician and one was a health care professional.
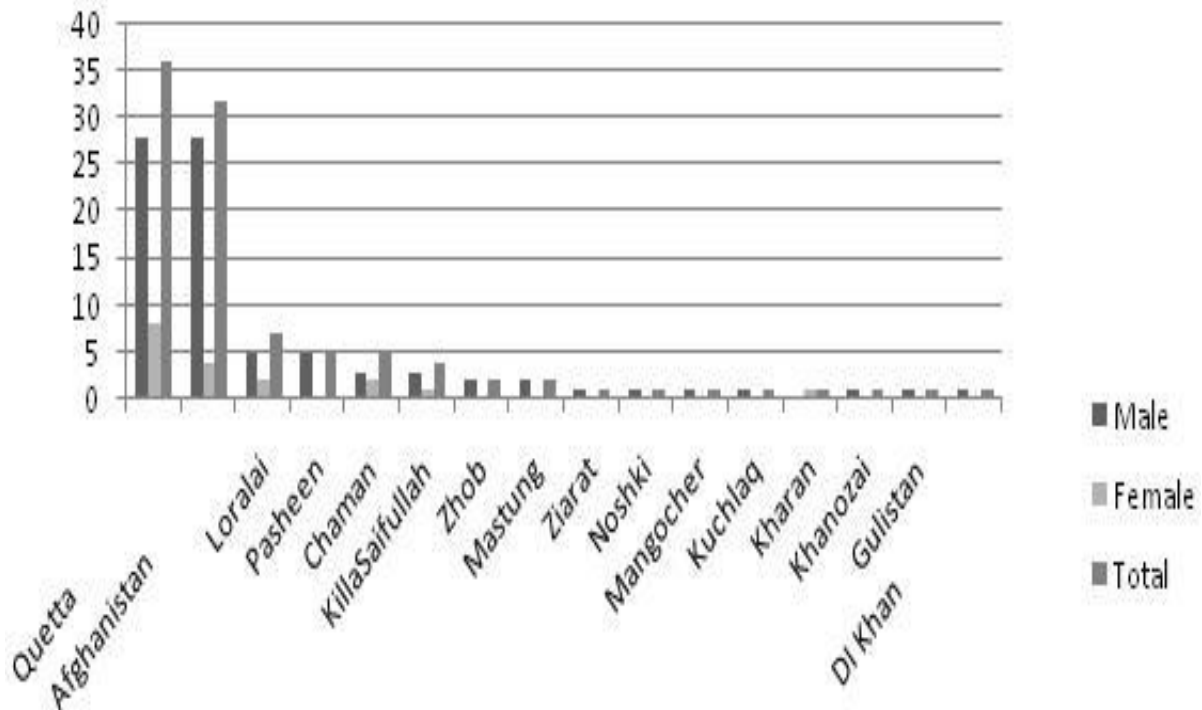
Figure-1. Residential Location with respect to Gender

Table-2: Occupational Status with respect to Gender

|		Gender		
		Male	**Female**	**Total**
Occupation	Labor	60	9	69
	House Wife	0	7	7
	Student	5	1	6
	Butcher	5	0	5
	Sheppard	3	0	3
	Farmer	2	0	2
	Driver	2	0	2
	Business man	2	0	2
	Tailor master	1	0	1
	Shop Keeper	1	0	1
	Mechanic	1	0	1
	House worker	0	1	1
	Health worker	1	0	1
Total		**83**	**18**	**101**

P-value=0.000

In the year 2007 total 32 (31.68%) cases were reported. In 2008, 24 (23.76%) cases were reported. In 2009, 22 (21.78%) cases were reported and in 2010, 23 (22.77%) cases were reported. Over the 4 years of time period there is significant number of reduction in CCHF patients. i.e. (p-value=0.001) (Table#4).In the present study, cases were more common between April and September, which shows the trend of Crimean Congo Hemorrhagic Fever occurrence, depicting the pattern of the disease. As, Sheikh *et al.,* (2005) study showed that more common CCHF cases were between March and May and again, between August and October.

Table-3: Cases Occurred in year 2007, 2008, 2009 and 2010

		Year				Total
		2007	**2008**	**2009**	**2010**	
Months	**January**	2	0	1	1	**4**
	February	0	0	2	2	**4**
	March	0	0	2	1	**3**
	April	4	1	2	1	**8**
	May	3	3	8	0	**14**
	June	7	2	1	8	**18**
	July	6	3	1	8	**18**
	August	4	4	1	2	**11**
	September	6	8	1	0	**15**
	October	0	3	3	0	**6**
	November	0	0	0	0	**0**
	December	0	0	0	0	**0**
Total		**32 (31.68%)**	**24 (23.76%)**	**22 (21.78%)**	**23 (22.77%)**	**101**

P-value=0.001
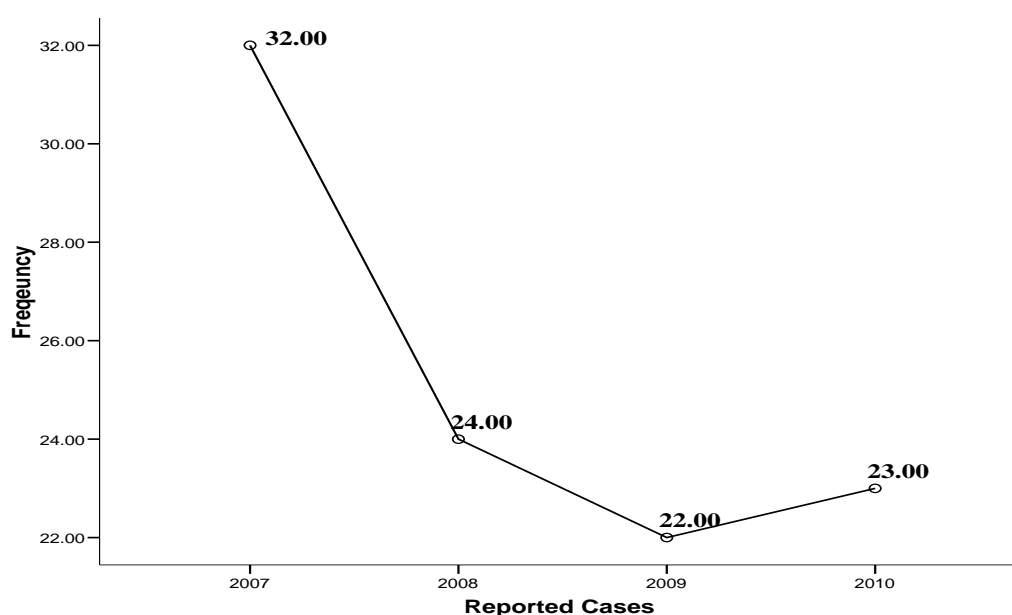
Figure-2. Cases Occurred in year 2007, 2008, 2009 and 2010

Among 101 patients, 5 (Male=4, Femlae-1)patients were found positive for IgG and IgM, and 3 patients were negative for IgG and IgM. Remaining 92 patient's tests results for IgG and IgM were not reported in their medical record. Out of 101 patients who suffered from CCHF 9 were having A$^+$ blood group, 44 with B$^+$, 16 patients blood group was O$^+$, 1 patients blood group was AB$^+$ and the remaining 29 patients blood group was not reported in their medical record. No significant association was observed for blood group with respect to gender of the patients suffered from CCHF. i.e.(p-value=0.623). Out of 101 patients 21 died and the remaining patients discharged/survived CCHF. Outcome of the patients (discharged or survived) is not depended upon the gender of the patients i.e. (p-value=0.420) (Table#5).As according to the study of Gonen (2011), total of 15 CCHF cases were diagnosed, from which 14 were discharged and 1 was died. Sixty-nine patients with CCHF were admitted to ANERH from various cities of northeastern part of the central region and southern parts of the Black Sea region of Turkey, 11 patients were died and 58 patients were discharged/survived (Cevik*et al*., 2008).

Table-4. (IgG/IgM), Blood Group & Outcome of CHHF Patients

		Gender		p-value
		Male	**Female**	
IgG	**Positive**	4	1	-
	Negative	3	0	
	Not Reported	76	16	
Total		**83**	**18**	
IgM	**Positive**	4	1	-
	Negative	3	0	
	Not Reported	76	17	
Total		**83**	**18**	
Blood Group	**A+**	9	2	0.623
	B+	37	7	
	O+	11	5	
	AB+	1	0	
	Not Reported	25	4	
Total		**83**	**18**	
Out Come	**Discharge**	67	13	0.420
	Death	16	5	
Total		**83**	**18**	

Sixty two patients had animals at their home. Among these patients, 5 had cattle/buffalo in their home, 4 had sheep/goat in their home and 18 had birds in their home (Table#6).Fifty-four (78%) patients out of sixty-nine patients with CCHF were involved in farming/handling of livestock (Cevik*et al*., 2008).

Table-5. Animals at Home

	Yes	No	Total
Animals at home	62	36	**101**
Cattle/Buffalo	5	96	**101**
Sheep/Goat	41	60	**101**
Birds	18	83	**101**

Conclusion and Recommendations

- CCHF were found all over the Balochistan, the result shows that CCHF is endemic in the province.
- CCHF cases from Afghanistan shows that it is endemic over there, therefore, the long open boarder of Afghanistan with the Balochistan province should be controlled.
- From Balochistan, the positive cases can easily enter other parts of the country, and easily transmit the infection. Therefore, all the ill persons who enter the Pakistan they should be first kept in an isolation ward and after confirm diagnosis, then they should be allowed to enter the Pakistan.
- Persons living in endemic areas should use personal protective measures.
- The patients with CCHF admitted to hospital, high preventive measures should be taken because of a risk of nosocomial spread of infection, patient should be isolated, and specimen of blood or tissues taken for diagnostic purposes should be collected and handled using universal precautions.

- It requires more effective efforts from the health care community for its eradication. It is also suggested to improve the health practices and health seeking behaviors of the public through educational campaign.
- The government should take steps by establishing the international standard diagnostic laboratory, which should be specific for the diagnosis of CCHF cases.

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