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**EPIDEMIC OF RIFT VALLEY FEVER IN SUDAN, GEZIRA, 2007; GEZIRA
EXPERIENCE**

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ABSTRACT

In the last 3 months of 2007, an acute episode of an ill-defined severe febrile illness presented to Medani hospital isolation wards, with severe hemorrhagic manifestations. This initially did not harbor any attention as other possibilities were thought of like severe malaria , septicaemia but by the end of the same week the number of patients increased dramatically and the suspicion was put and the whole case was addressed officially in an epidemical paradigm.

This study was conducted in Wad Medani Teaching Hospital. From the beginning of 41st week of the year 2007, the Gezira state in Sudan was tremendously affected by an epidemic of Rift valley fever as declared by the WHO authorities (11).all the districts of the estate were involved with a total number of patients was around 392.

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During the period of epidemic of RVF, (week 41.2007 - up to the 1st week of January 2008) total number of patients admitted were about 392 and total number of patients died were 158 patients. The main presenting symptoms were fever, epistaxis, haematemesis and vaginal bleeding, and the main complication was acute renal failure and death.

Keywords: Epidemic, RVF, Gezira, Sudan.

INTRODUCTION

Hemorrhagic fever viruses are a diverse group of viruses that causes a clinical disease associated with fever and bleeding disorder classically referred to as viral hemorrhagic fevers. The many viruses that are associated with this illness belong to one of the four families Filoviridae, Arenaviridae, Bunyaviridae and Flaviviridae⁽¹⁾.

Rift Valley Fever (RVF) is an arboviral disease produced by a bunya virus belonging to the genus phlebovirus. Several species of *Aedes* and *Culex* are the vectors of this virus that affect sheep, goats, buffalos, cattle, rarely camel and human beings⁽²⁾.

It may be encountered as an uncomplicated influenza like illness, but may also present as haemorrhagic disease with liver involvement. There may be an ocular and and/or neurological lesions⁽³⁾.

The high activity of the RVF virus is related to a tremendous increase of associate mosquitos' vectors, which follows periods of high rainfall. Indeed, rainfall creates an ecologically humid environment that insures the proliferation of breeding sites and the development of RVF vectors⁽⁴⁾.

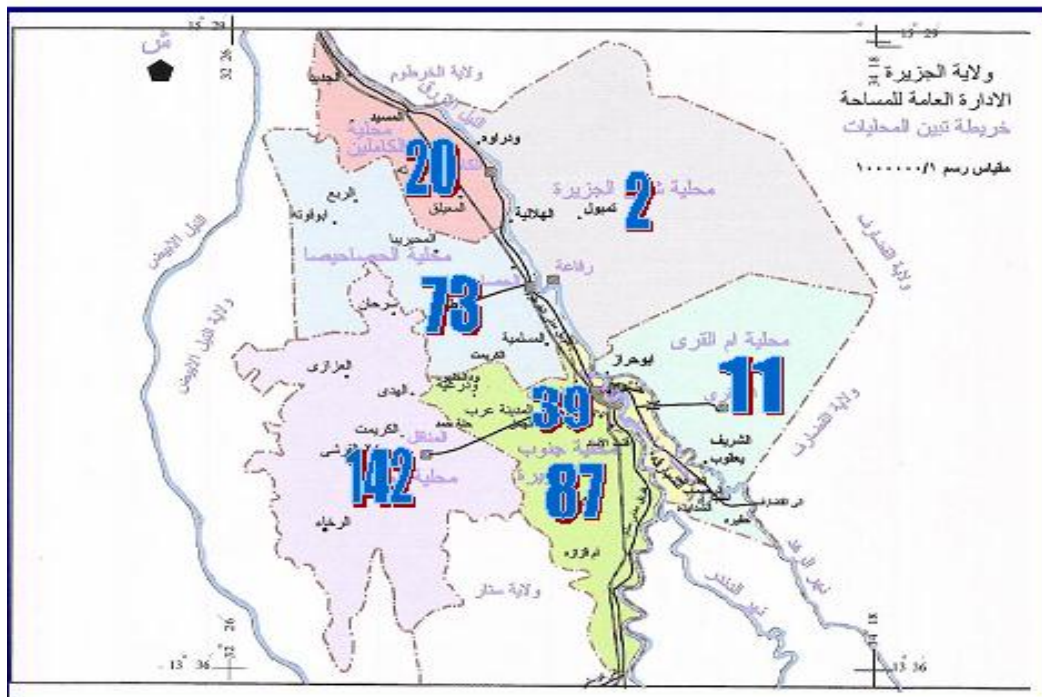
The virus is transmitted transovarially or it may remain dormant in mosquito eggs during dry interepizootic periods. Animal involvement characterized by abortion in pregnant animals and high mortality in newborn lambs, kids and calves. Human beings experience the virus as influenza – like illness and/or more rarely complication such as encephalitis or retinitis and it may cause severe hepatitis and jaundice⁽⁵⁾.

Virus transmission to man also occurs by contamination when handling infected meat or by inhaling natural virus aerosol, wild rodents apparently do not serve as RVF reservoirs domestic animal acts as amplifying hosts⁽⁶⁾.

Renal impairment was a frequent occurrence among the RVF, and it appeared to be the result of hypovolemia and multiple organs dysfunction in the majority of patients. However, the renal failure may be attributed to a direct virus related injury in a proportion of the patients. However, Inference from immunofluorescence showed that the site of replication correspond to the

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glomerular lesion⁽⁷⁻¹⁰⁾. The epidemic of rift valley was thought of in the weekly reports of the WHO⁽¹¹⁾. The objective of this study was to do situation analysis of the RVF epidemic, Sudan, Gezira, 2007.



PATIENTS AND METHODS

This study was conducted in Wad Medani Teaching Hospital. In the isolation words. From the beginning of 41th week of the year 2007, the Gezira state in Sudan was tremendously affected by an epidemic of Rift valley fever as declared by the WHO authorities (11).all the districts of the estate were involved with a total number of patients around 392 admitted in Medani. Health authority procured all energies and efforts to control this ordeal in a collaborative system including preventive and supportive measures. In the scene of treatment of established cases, an isolated premise was allocated at the vicinity of the general hospital with a separate staff volitionally trained and a ministerial committee governing the whole process.

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Suspected cases were admitted through certain strict measures not only based on circumstantial evidence but also upon laboratory evidence. Physician, pathologist and an ensemble from the epidemic control unit were in charge and actively shouldering the responsibility in its whole scenarios. Nephrologists were also included in the team.

Patients were assigned as cases of renal impairment under the strata of history work up, clinical and laboratory findings. At this time the nephrologists carries on.

Renal substitution therapy was conducted either as a conservative and/or peritoneal dialysis when there was an indication according to the general measures of treating patient with acute renal dysfunction. Peritoneal dialysis was conducted with 60- 200 runs and through soft catheters with antibiotics routinely administered as prophylaxis.

Serial evaluation of renal function tests was done to assess the progress and \or regress of the patient. Precautions in taking blood samples, nursing and drug delivery were assured for all the working staff. Insecticide impregnated nets were provided for every patient.

In cases of hepatic and renal insufficiency, we adopted the same measures of strict conservative treatment for hepatic precoma with cautious intensive care and serial electrolyte balance.

Haematological indices were estimated at the time needed by an available and trusted laboratory supervised by a consultant haematologist.

Frequent supportive treatment in counteracting haemorrhagic episodes, blood and blood product substitutions were given under strict supervision. Competent good nursing and protective measures were instituted efficiently.

Daily progress or regress of patient's condition was recorded with over all scientific address to the whole crises.

At the same time, patients reported later with ocular or other departmental manifestations were reported and referred to be followed by this team.

Data, which was already saved and analyzed, was then retrieved from this working group and incorporated within the pool.

RESULTS

During the period of epidemic of RVF (week 41.2007 - up to the 1st week of January 2008) total number of patients admitted were about 392 and total number of patients died were 158 patients (table 1)

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Table (1): Number of admission and deaths for the period (week 41.2007 – up to the 1st week of January 2008) of RVF epidemic, Sudan, Gezira.

Weeks	Cases	Deaths
41	1	1
42	2	2
43	15	10
44	54	30
45	80	35
46	89	36
47	52	20
48	29	10
49	24	6
50	32	5
51	1	0
52	8	2
1 st wk 2008	5	1
Total	392	158

Regarding the clinical presentation, we found that the presenting symptoms were fever (90 %), renal failure 60 % and epistaxis and Haematemsis were about 36 % (Table 2, Figure 1) showed the distribution of patients according to clinical presentation .

Table (2): Presenting Symptoms and signs of RVF epidemic, Sudan, Gezira, 2007

Symptoms	Percent
Fever	90%
Epistaxis	36%
Jaundice	35%
Haematemsis	36%
Vaginal bleeding	35 %
Bleeding gums	21%
Hematuria	16%
Coma	11%
Subconjunctival haemorrhage	10%
Renal failure	60%

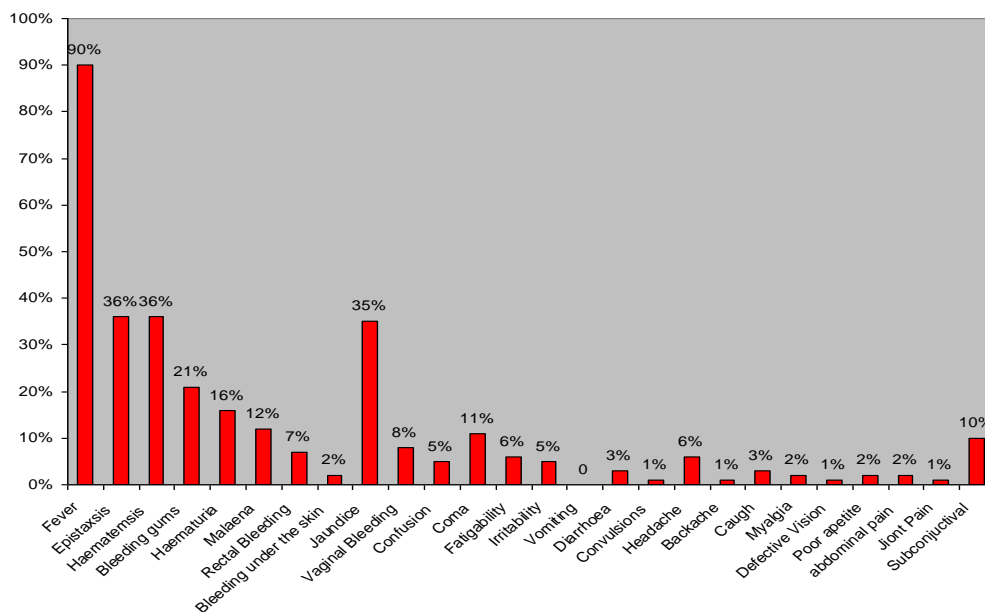
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Table 3: Showed the distribution of patients according to occupation; most of the studied group are housewife and medical assistant came at the end of list.

Table 3: distribution of occupation of RVF epidemic, Sudan, Gezira, 2007

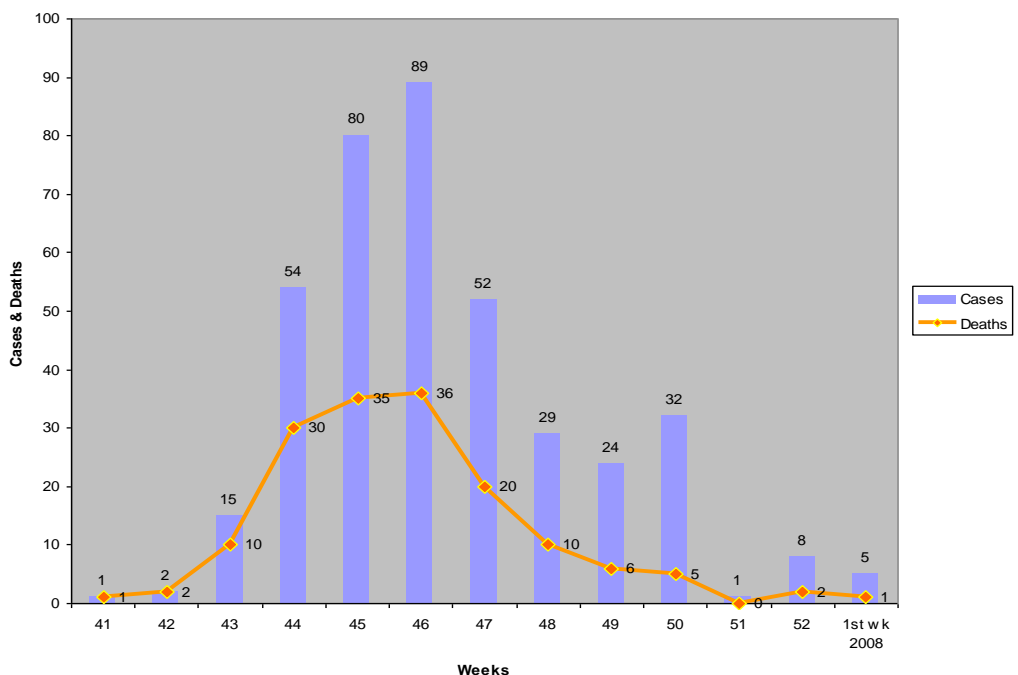
Occupation	Number
House wife	99
Farmer	78
Student	45
Labourers	29
Shepards	27
Children	8
Teacher	6
Butchers	5
Medical assistant	1
others	94
Total	392

Figure 1: Symptoms and signs of RVF epidemic, Sudan, Gezira, 2007



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Fig 2: Pattern of the epidemicity of RVF epidemic in Sudan,Gezira 2007



Discussion

Rift Valley Fever is usually found in regions of eastern and southern Africa but the virus also exists in most countries of sub-Saharan Africa and in Madagascar.

It is a zoonotic that mainly affects domestic animals (cattle, buffalo, sheep, goats, rarely camels) and occasionally humans. (12) And mosquitoes usually of the genus *Aedes* transmit Bunya viruses. Humans also can get the disease after handling blood or body fluids of infected animals.

Infection through aerosolisation has been reported in laboratory workers when working with virus cultures or laboratory samples containing viruses (13).

Usually Rift Valley fever is mild and associated with fever and liver indices abnormalities but in its severe form hemorrhage, encephalitis and retinitis may occur (14, 15).

In the last 3 months of 2007, an acute episode of rift valley appeared in epidemic pattern. (table1)

Hemorrhagic fever viruses induce a similar syndrome. The incubation period varies from one to 21 days. The disease can progress to respiratory problems, severe bleedings, kidney failure and shock. All hemorrhagic fevers can induce

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micro-vascular damage and capillary leak syndrome (16). According to the observation and work up of our team this incubation period could be from 2 days to 4 weeks

The age ratio in the affected patients groups lies between 15 years to 65 years with a mean age around 34 years. This revealed that the active years of life were the commonest to be affected. However no age was immune and those who were in tangible contact with animals were at risk (table 3).

It was also obvious that the majorities of patients either were from rural areas or are nomadic villagers. Larger towns were less involved in this epidemic.

It was known that the virus is transmitted to humans through mosquito's bites or by exposure to blood and body fluids. Drinking raw unpasteurized milk from infected animals can also transmit RVF.

Routine vaccination of livestock in Africa has been prohibitively expensive leading to endemicity of the virus in most of the African countries (16)

It is known that haemorrhagic fevers should be suspected in any patient presenting with severe illness and evidence of haemorrhagic tendency, who has traveled to or resided in an area where the virus is endemic (13).

When the epidemic was established, clinical awareness was optimized to the zenith. Any patient presented with obscure febrile condition, severe prostration and flu like symptoms was a subject for strict evaluation. Frank severe cases with bleeding and acute jaundice or oliguria were the leading caveat for picking patients. More than 200 patients were admitted as cases of RVF. Serological studies, haematological survey, serial renal function assessment and liver function tests were routinely done. Thrombocytopenia was usual although not usually of sufficient severity to account independently for haemorrhagic episodes. Leucopenia was also reported and protein urea and elevation of liver enzymes. However, it was quite peculiar to our experience, that thrombocytopenia was the yardstick in diagnostic and prognostic sequelae of our patient.) The symptomatology was protean; fever was the leading symptoms in our series with bleeding and jaundice all cases of hepatic and renal impairment presented with fair to deep. As known jaundice is typical in yellow fever and RVF valley fever (17). (table2+fig1)

Patients with renal impairment were generally bleeders but in certain cases, the only presentation was oliguria, odema or pulmonary odema.

All patients with renal failure were subjected to the known management of acute renal failure and renal substitution. Therapy was delivered when there were chemical or symptomatic indications in the form of peritoneal dialysis by soft catheters and 60-200 runs (120 to 400 liters). Minor bleedings occurred from the site of catheters. For hemorrhagic manifestation, fresh frozen plasma and fresh blood were given when needed. No antiviral drugs were administered. Patient

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with hepatic impairment also received management of hepatic coma. The epidemic started to decay with the solidarity of sectors concerned of the team at the beginning of 2008. (fig2)

Lesson to learn:

1. Alert is the yard stick for epidemic management.
2. Collaboration between the different sectors.
3. Mobilization of resources.
4. Department for disasters management is to be established.
5. Good professional conduct (despite of what written in the media) will help in dealing with such plight.

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