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النشرة الوبائية السعودية

تصـــدرها وزارة الصحـــة
الوكالة المساعدة للطب الوقائي وبرنامج الوبائيات الحقلي
المجلد الثـــامن ـ العـــدد الأول ـ يناير ـ مـــارس ٢٠٠١

Rift Valley Fever Outbreak, Saudi Arabia, 2000.

On 2/06/1421 H King Fahad Central Hospital in Jazan began receiving several cases of unexplained hemorrhagic fever. At that time, the cases were localized to AlArda district in Jazan region. The clinical picture included low grade fever, abdominal pain, body ache, vomiting and diarrhea, jaundice with liver and renal dysfunction often progressing to disseminated intravascular coagulation, hepatorenal syndrome, and death. The diagnosis of Rift Valley Fever (RVF) was confirmed.

This study was conducted during the period from 27/05/1421 to 30/01/1422 H, to identify the extent and severity of the outbreak; and to study the clinical presentation and complications of the disease. A Case definition was developed and distributed to all hospitals and primary health care centers to detect further cases and report them by completing a case report form, which included identification and demographic data, hospitalization, clinical history, history of contact with an RVF case, positive family history, history of exposure to environmental risk factors, results of laboratory investigations, clinical status, and complications. This form was then sent to the regional health directorate, and on to the Ministry of Health in Riyadh within 24 hours, to be entered into the computer and analyzed.

The total number of patients was 882; 747 (85%) Saudis, 113 (13%) Yemenis, and 22 (2%) other nationalities; 709 (80%) males and 173 (20%) females, the male to female ratio was (4:1). The mean age (± SD) was 45.7 (± 20) years. Forty seven percent (47%) were reported from Jazan, 48% from Asir, 4% from Qunfudha, and the rest from other regions.

The total number of cases increased gradually from the first week, when only 5 cases were reported, reaching the maximum on the fourth week with 93 reported

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cases, then fell gradually until the eighth week with 56 reported cases. After that, the number of cases increased again to reach the highest peak on week 10 with 99 reported cases. The cases started to fall again until the end of the outbreak, when the last case was reported on week 28 (Fig 1).

Symptoms of the acute illness were mainly fever (91%), nausea (58%), vomiting (51%), abdominal pain (39%), and diarrhea (24%).

Blood investigations revealed that 218 patients had a platelet count <100000 mm^3 (mean ±SD = 132.8 ±89.5), 88 had hemoglobin < 8g/dL (mean ±SD = 11.34 ± 3.12), 231 had WBC <3/dL. About 90% of the patients had AST and ALT more than 3 times normal, 90% had LDH more than 2 times normal, 30% had CPK more than 2 times normal, 16% had creatinine >150 Umol/L and 15% developed Jaundice with high bilurobin.

Sixty-six percent (66%) reported direct contact with animals and 98% reported exposure to mosquitoes. The total number of deaths was 124, revealing a case fatality rate (CFR) of 14.1%.

Hemorragic complications were the most common, developing in 49 cases (7.6%). Hematemesis occurred in 25 (51%), puncture site bleeding in 14 (29%), and melena in 12 (25%). The total number of deaths among patients with hemorrhagic complications was 32 (65%). Symptoms of encephalitis appeared in 110 (18%) patients. The most common neurological manifestations were confusion in 48 (44%), lethargy in 43 (39%), disorientation in 40 (36%), coma in 21 (19%) and vertigo in 20 (18%) patients. The total number of deaths among patients with neurological complications was 60 (55%). Visual complications developed among 13 patients (2%), the most common were visual loss in 10 and scotomas in 3 patients.

— Reported by: Dr. Ahmed M. Sahly, Dr. Abdullah M. Al Rabeah (Field Epidemiology Training Program)

Editorial note: Since the discovery of RVF in 1931,[1,2] the disease was seen to spread across most African countries. It moved outside Africa for the first time during this outbreak, which was also recorded in Yemen. It is thought to have entered Saudi Arabia either through infected animals imported to Jazan region, or through infected mosquitoes carried by the wind.[3]

The epidemic curve showed two peaks; on week 4 and week 10, which may be related to the difference in timing of the start of the outbreak between Jazan and Asir regions.

Blood manifestations of thrompocytopenia, anemia, and low prothrobin and thrombin time are common in all RVF outbreaks, and are typical of hemorragic fever.[2,4] Liver enzymes were very high due to severe hepatocellular necrosis, and creatinin was high due to renal failure, which are known complications.[2,4] The high CFR of 14% is compatible with a reported CFR of 15% among hospitalized patients in the RVF outbreak in Egypt.[5]

Hemorrhagic complications developed in 7.6%, which is very high compared to previous reports of 1%. However, this percentage only represents severe cases that had presented to hospitals. The death rate was very high among this group (67%), which is higher than previous reports of 50%.[4] Furthermore, encephalitis occurred in 18%, which is much higher than previous reports of 1%. [5] Visual complications occurred in 2% which is similar to previous reports.[5]

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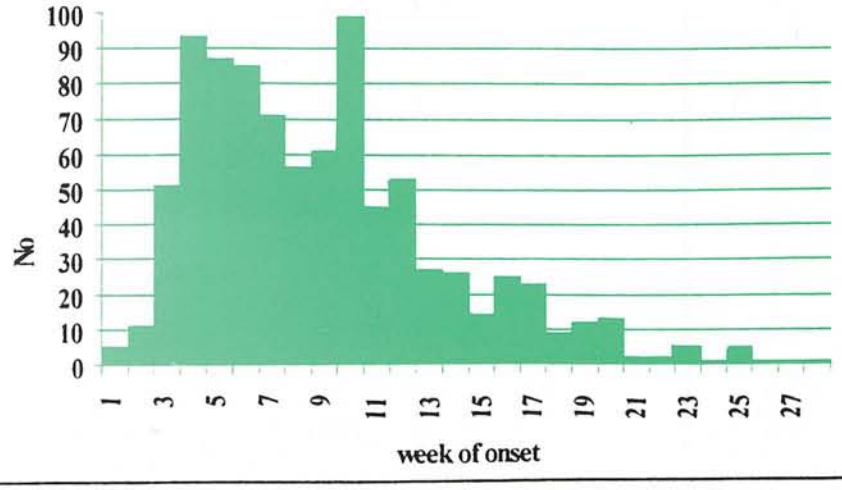
Figure (1): Reported cases of RVF by week of onset, Saudi Arabia, 27/05/21- 30/01/22



Risk Factors of Rift Valley fever Among the Samtah Population, Jazan, Saudi Arabia.

Rift Valley Fever (RVF) was reported for the first time in Saudi Arabia after several cases of unexplained hemorrhagic fever appeared in the southwestern border (Jazan Region). Cases were reported by all governorates of Jazan, including Samtah Governorate. A nested case control study was conducted to identify risk factors for acquiring RVF.

All RVF cases diagnosed and confirmed serologically at Samtah General Hospital were reviewed and their addresses located. A list of PHCCs with its census was provided from the Samtah Health District. Four controls were selected for each case, proportional to the census of each PHCC, regardless of the location of cases. At each PHCC an accumulative number was assigned to each medical record. A random number chart was used to select controls. The name, medical record number, and location were registered according to sequences of the selection. All study participants were interviewed face to face using a standard questionnaire. Parents were interviewed on behalf of young children. The questionnaire included demographic information, history of underlining medical conditions, and risk factors of RVF.

The final study sample included 39 Cases and 238 Controls. Among the cases, 28 (72%) were males; median age was 43 years (range 7-85 years); 31 (80%) were Saudis and 8 (20%) were Yemenis. Among the controls, 126 (53%) were males; median age was 18 years (range 2-92 years); almost all of them 237 (99.6%) were Saudis, except for one Indonesian. The majority of both cases and controls had no history of chronic diseases.

Table 1 demonstrates behavioral and community risk factors for acquiring RVF. Only 10 cases and 195 controls reported sleeping inside the houses. Those who reported sleeping outside the house were at a higher risk of RVF, whether they slept outside regularly (OR =14.2, P-value <0.05) or occasionally (OR=11.1, P-value <0.05). Those who sprayed insecticides were protected from RVF, but use of a bednet was not protective. Those who drank raw milk without boiling or pasteurizing were at a higher risk of RVF, whereas handling raw meat while cooking, eating raw meat or other raw animal organs had no effect. Mosquito bites were not associated with acquiring RVF. However, those who owned sheep among those bitten by mosquitoes had a ten times risk of acquiring the disease. Stagnant water had no effect on acquiring the disease, regardless of its proximity to houses.

Individuals who owned animals were twice at risk of RVF than those who did not (Table 2). Sheep were the most implicated animal for their owners to acquire the disease. The risk increased the higher the number of animals, regardless to their type. Owning animals led to other risk factors that increased susceptibility for RVF (Table 3), such as shepherding, the risk increasing the longer the time spent in shepherding. Also, allowing animals inside the house increased the risk, which further increased the longer they are allowed in the house. Reported aborted animals, animal deaths, helping in animal birthing, or slaughtering were also associated with risk of RVF. However, milking was not statistically associated with acquiring RVF.

– *Reported by: Dr. Adel M. Turkistani, Dr. Yagub Y. Al Mazrou, Dr. Fadoul M. Bakhsh, Dr. Randa M. Nooh, Dr. Abdulaziz M. AlMazam, Dr. Ahmad A. Sahli, Dr. Ali Al hazmi, Dr. Ali S. Khan (CDC).*

Editorial notes: This study was targeted to identify possible risk factors of acquiring RVF. Although there is a difference between cases and controls in age, sex, and nationality, these factors have not been proved to contribute to acquiring RVF in the few studies that have been conducted.[1,2-4] This study was primarily designed to select controls

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Table 1: Behavioral and Community Risk factors for acquiring RVF

Exposure	Case (n= 39)	Control (n= 238)	Odds Ratio	P-value
Behavioral Risk factors:				
Sleeping habits:				
Outside the house	8	11	14.2	<0.05
Both (outside & inside)	16	28	11.1	<0.05
Inside the house	10	195	Ref.	Ref.
Used a bednet	2	6	0.53	0.5
Sprayed insecticide	14	177	0.23	<0.05
Food Habits:				
Drank unpasteurized milk	25	30	12.4	<0.05
Cooked raw meat	20	95	1.6	0.2
Ate raw meat	1	4	1.5	0.7
Ate raw liver	6	23	1.7	0.3
Ate raw spleen	2	5	2.5	0.3
Ate other raw animal organs	3	13	1.4	0.6
Community Risk factors:				
Mosquito Bites	31	163	1.8	0.2
Bitten and owned sheep	28	89	10.7	<0.05
Not bitten and owned sheep	1	34	Ref.	Ref.
Stagnant Water	10	75	0.8	0.5
Far from the house (≥ 50m)	3	36	0.5	0.2
Close to the house (< 50m)	7	39	1.0	0.9

Risk Factors of Rift Valley fever, Cont ...

that represented the population and had been exposed to the same risk factors.

At the time this study was conducted, there was no available information on the prevalence of RVF. It is well known that the majority of cases may acquire the infection without developing complications,[1] and may recover without recognition. Up to date, the risk of acquiring RVF is mainly through exposure to or contact with fresh tissue of infected animals, or by infective mosquito bites. Although the study showed that those bitten by mosquitoes were two times at risk of RVF, this, however, could not account for those bitten by mosquitoes but were not affected by RVF. It is uncertain what role, if any, mosquitoes play in the transmission of RVF to humans.[5,6] If they do play a role, the presence of stagnant water close to houses should have been a risk factor, since it is the main mosquito breeding area. Mosquitos may, however, play a role in transmission of RVF to humans if livestock develop high viremias, coinciding with the presence of a high density of mosquitoes. This may explain why those who reported sleeping outside the houses were at a higher risk of acquiring RVF, the risk increasing when this occurs on a daily basis. Spraying insecticide, which diminishes the density of mosquitos, was found to play an important role in the prevention of RVF. However, use of a bednet, which may play a role in prevention of mosquito bites, was not a common practice among the study population.

Some studies suggest the possibility of transmission of RVF to humans by drinking infected milk[1,2], which was proved in our study. Those who drank raw milk were twelve times at risk, pointing to the presence of the virus in milk.[4]

Although direct contact with tissues and organs of infected animals is thought to transmit the disease, this may only be true if the person has an open wound through which the virus can penetrate. Handling raw meat while cooking was not associated with RVF infection, nonetheless, precautions should be taken in case of epidemics. Eating raw meat or other raw animal organs was not proved to be a risk factor, however, this habit should be stopped immediately, particularly in endemic areas. The possibility of acquiring the disease by contact with infected fresh animal organs could not be ruled out, since those who helped in animal birthing or slaughtering had more than twice the risk of infection.

Owning animals was considered a major risk for RVF, especially sheep and goats. However, an opposite result was found among owners of cattle (cows), since their larger size kept them away from houses. Abortions or unexplained deaths among animals were significant risk factors, and could be used as indicators to the possibility of animal infection, thus allowing early detection, and should be considered in

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Table 2: Risk of RVF by contact with animals

Exposure	Case (n= 39)	Control (n= 238)	Odds Ratio	P-value
Owned animals	29	137	2.1	<0.05
Sheep	29	122	2.8	<0.05
More than 40	8	22	4.2	<0.05
21 – 40	9	39	2.7	<0.05
1 – 2	12	61	2.3	0.07
Goats	17	58	2.4	<0.05
More than 40	5	12	3.4	<0.05
1 – 40	12	46	2.1	<0.05
Cattle	16	50	2.6	<0.05
More than 5	5	17	2.4	0.1
1 – 5	11	33	2.7	0.01
Camels				
Median= 2 (1-8 Camels)	2	8	1.6	0.6
Other animals				
Median= 1 (1-6 Donkeys)	6	14	2.9	<0.05

Table 3: Risk Factors of RVF among those who owned animals

Exposure	Case (n= 29)	Control (n= 137)	Odds Ratio	P-value
Shepherd animals	22	42	7.4	< 0.05
13 – 24 hours	9	10	12.2	<0.0001
07 – 12 hours	4	5	10.9	<0.0001
01 – 06 hours	9	27	4.5	<0.001
Allowed animals inside house	26	73	7.6	< 0.05
13 – 24 hours	11	28	8.4	<0.0001
07 – 12 hours	10	19	11.2	<0.0001
01 – 06 hours	5	26	4.1	0.05
Reported aborted animals	25	52	10.2	< 0.05
≥ 5 aborted animals	19	38	10.6	<0.0001
1 - 4 aborted animals	6	14	9.1	<0.0001
Reported dead animals	19	63	2.3	< 0.05
≥ 5 dead animal	15	42	2.6	< 0.05
1 - 4 dead animal	4	21	1.4	0.6
Help animal birthing	13	25	3.6	0.002
Slaughtering animals	12	28	2.8	0.002
Milking animals	10	27	2.1	0.08

Risk of acquiring Rift Valley Fever in a hospital setting?

In August 2000, the first confirmed occurrence of Rift valley fever (RVF) outside the African continent was described in the Arabian Peninsula. At that time, the true risk to health-care workers (HCWs) for acquiring RVF in the hospital setting had remained unstudied. The objective of this study is to estimate the risk to HCWs for the nosocomial acquisition of RVF in Jazan.

This study was conducted at four hospitals in the Jazan province: King Fahad Central Hospital (KFCH), Samtah General Hospital (SGH), Al-Ardah General Hospital (AGH), and Beash General Hospital (BGH). A retrospective cohort study was conducted whereby two groups, high and low risk, were identified according to their exposure to potential nosocomial risk factors. These factors included contact with 10 or more RVF patients, body fluids, potentially infectious material, or performing invasive procedures to patients. A questionnaire inquiring about demographic characteristics, job description and place of assignment, level and type of hospital exposure, precautionary measures used and possible environmental exposures, was completed by HCWs in both groups. A blood sample (5 ml) was taken from each participant to be tested for IgM and IgG antibodies to the RVF virus. Evidence of infection during the epidemic was defined as any individual in the cohort with detectable IgM and IgG antibodies to the RVF virus.

A total of 703 HCWs participated in this study, most of whom were from KFCH (266 or 38%) and SGH (240 or 34%). Their mean age was 33 $\pm$ 9 years, and males represented 49% of the study population. The most common nationalities included were Indians (37%), Saudis (26%) and Filipinos (12.5%). By occupation, nurses ranked first 312 (44.6%), followed by cleaners 115 (16.5%) and physicians 80 (11%). A total of 336 (47.8%) of the HCWs were among the high-risk group. Among those, the most common potential risk factors were close contact with 10 or more RVF patients (64.3%), inserting peripheral line (29%), and drawing arterial blood gases (23.8%). With respect to community exposure, 74 (10.7%) HCWs reported direct contact with animals, 347 (49%) lived in areas with heavy mosquito infestation, but only 242 (35%) reported having had mosquito bites.

With respect to hospital protective measures employed by staff, 73.3% reported wearing gloves, 68% reported using face masks, and 60.8% reported always wearing gowns when dealing with suspected or confirmed RVF patients, body fluids, or potentially infectious material. Four (0.6%) of 703 participants had evidence of recent RVF virus infection, all of whom were in the "low risk group" and reported exposure to known RVF risk factors at their community level.

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Editorial note: Only four (0.6%) of the participants were infected by RVF virus, which is far below a previously reported rate of 6.7%.[1] This was, most probably, because HCWs had less exposure to animals and mosquitoes than the general population. Three RVF antibody positive HCWs were from Al-Ardah hospital and were living outside the hospital. Al-Ardah was the area where the first and majority of the RVF cases in Jazan had been reported, and where 90% antibody prevalence was found among animals in a survey done in this area.[2]

Needlestick and other percutaneous injuries resulting in exposure to blood or other potentially infectious materials continue to be of concern due to their high occurrence and their severe adverse outcomes.[3] Interestingly, Despite all potentially "high risk" nosocomial exposures, none of the potentially high-risk groups were found to have evidence of infection with the RVF virus.

The four RVF antibody positive HCWs acquired the infection, most probably, as a result of environmental exposure rather than nosocomial acquisition. Nosocomial transmission, if it occurs, seems to be very rare in the context of, at least, rudimentary standard precautions.

Our data strongly suggest that implementation of standard precautions alone is sufficient when dealing with known or suspected RVF patients.

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ملخص باللغة العربية

تقرير عن حمى الوادي المتصدع – المملكة العربية السعودية - الفترة من ١٤٢١/٥/٢٧ - ١٤٢٢/١/٣٠هـ

في اليوم العاشر من شهر سبتمبر لعام ٢٠٠٠ تلقت وزارة الصحة تقريرا من منطقة جازان عن ظهور حالات حمى نزفية غير معروفة تركزت في محافظة العارضة. وقد جاء تأكيد التشخيص مخبريا لفيروس حمى الوادي المتصدع .

أجريت هذه الدراسة للتعرف على مدى انتشار الحالات، و الأعراض المصاحبة للمرض و مضاعفاته. و قد تم وضع تعريف موحد للحالات المشتبهة، وزع على المستشفيات والمراكز الصحية. و تم إعداد استبيان موحد يحتوي على معلومات تعريفية بالمرض، حالة المريض، الأعراض، الفحوصات المخبرية ، وعوامل الخطورة التي تعرض لها المريض .

بلغ إجمالي الحالات المكتشفه في الفترة ما بين ١٤٢١/٥/٢٧ –١٤٢٢/١/٣٠ (٨٨٢) حالة، منهم (٧٤٧) سعودي ، (١١٣) يمني، (٢٢) من جنسيات مختلفة. بلغ عدد الذكور ٧٠٩ (٨٠ %) والإناث ١٧٣ (٢٠ %) وبلغت نسبة الذكور إلي الإناث (٤: ١).

بلغ متوسط أعمار الحالات (٤٥,٧ ± ٢٠,٠٢) والمدى ١-٩٩ وقد ظهر أن ١٨ % من الحالات تقع في الفئة ٦٠ – ٦٩ سنة والتي تعتبر الأعلى بين جميع الفئات العمرية . ولم تسجل في الفئة العمرية أقل من عشرة سنوات سوى ٤ حالات فقط . و قد أظهر المنحني الوبائي ارتفاع الحالات تدريجيا من الأسبوع الأول حيث سجلت خمس حالات فقط لتصل إلي أعلى مستوي لها في الأسبوع الرابع حيث بلغ عدد الحالات٩٣ حاله . ثم بدأت الحالات في الانخفاض لترتفع مجددا مع بداية الأسبوع الثامن لتسجل أعلي مستوى لها في الأسبوع العاشر حيث بلغ مجموع الحالات ٩٩ حالة. ثم بدأت الحالات في الانخفاض إلي أن سجلت آخر حالة في الأسبوع الثامن والعشرين .

وقد أوصى التقرير باستمرار المراقبة النشطة للحالات المشتبه فيها وسرعة التبليغ عنها، معرفة التقارير التي ترد عن حالات الإجهاض وسط الحيوانات ويعتبر هذا مؤشر أولي عن انتشار المرض، التطعيم الدوري للحيوانات، تطوير لقاح للإنسان، توعية العاملين في الحقل الصحي، استمرار التوعية الصحية في المجتمع، منع استيراد الأغنام من البلدان التي يستوطن بها المرض، وإحكام الرقابة في المنافذ والمحاجر الصحية.

إعداد: د. أحمد سهلي، د. عبد الله الربيعة (برنامج الوبائيات الحقلي)

دراسة ميدانيه عن إمكانية انتقال حمى الوادي المتصدع للعاملين في المستشفيات، جازان ١٤٢١هـ

أجريت هذه الدراسة لمعرفة إمكانية انتقال مرض حمى الوادي المتصدع إلى العاملين في المستشفيات و جدوى الإجراءات الوقائية المتخذة للوقاية من المرض. تم اختيار أربعة مستشفيات في منطقة جازان لإجراء هذه الدراسة. و تم تقسيم العاملين في المستشفيات حسب تعرضهم لعوامل الخطورة إلى مجموعتين: الأولى مجموعة عالية الخطورة، و تشمل الذين أفادوا باختلاطهم مع ١٠ أو أكثر من مرضى حمى الوادي المتصدع، التعرض إلى جرح أثناء التعامل معهم، عمل وصله طرفيه أو مركزيه ، أخذ عينه شريانية، عمل ضماد للجروح، إجراء إنعاش قلبي، أخذ عينه خزعيه من الظهر أو إجراء عمليات صغرى لهم. و المجموعة الثانية منخفضة الخطورة، و تشمل الذين لم يفيدوا عن تعرضهم لعوامل الخطورة أعلاه. تم إعداد استبيان وتوزيعه على المشاركين في الدراسة، كما تم أخذ عينة دم منهم و إرسالها إلى المختبر الرئيسي في الرياض لتحليلها.

شارك في الدراسة ٧٠٣ موظف، ٢٦٦ (٣٧,٨%) من مستشفى الملك فهد، ٢٤٠ (٣٤,١%) من مستشفى صامتة العام، ١١١(١٥.%) من مستشفى العارضة، و ٨٦ (١٢,٢%) من مستشفى بيش العام. منهم ٨٠ (١١%) طبيب، ٣١٢ (٤٤,٦ %) موظف بمهن تمريضية، ٤٣ (٦,٢ %) فني مختبر، ١١٥ (١٦,٥%) عامل نظافه، ١٥٣ (٢١,٧ %) موظف بمهن أخرى. بلغ عدد الذكور ٣٤٦ (٤٩%) و الإناث ٣٥٧ (٥١ %)، و متوسط الأعمار ٣٣ سنه (مدى ٢٠ – ٦٤). كان عدد المشاركين من الجنسية الهندية ٢٦٠ (٣٧%)، و السعوديين ١٨٣ (٢٦%)، والفليبينيين ٨٨ (١٢،٥%). بلغ إجمالي عدد عينات الدم التي تم تحليلها ٧٠٣ عينة، ٤ (٦، %) منها إيجابية و٦٩٩ (٩٩,٤ %) سلبية. كما تبين أن ٣ (٧٥ %) من المصابين و ٥٧ (٨,٢ %) من غير المصابين سبق وأن أشتكوا من حمى خلال الشهرين السابقين للدراسة.

أما الحالات الإيجابية فكان بينها ثلاثة سعوديين، و واحد من الجنسية الهندية. نسبة الذكور إلي الإناث ١:٣ ومتوسط أعمارهم ٣٢ سنه (مدى ٢٢- ٣٥). يسكن السعوديون خارج سكن المستشفيات بينما يسكن الموظف الهندي داخل السكن. ينتمي جميع المصابين إلي المجموعة منخفضة الخطورة حيث أفادوا بأنهم لم يحتكوا بمرضى حمى الوادي المتصدع و لم يتعرضوا لعوامل الخطورة المشتملة عليها الدراسة. بينما أفاد ثلاثة منهم باحتكاكهم المباشر مع الحيوانات.

و قد تعرض ٢١٦ (٢٩ %) من الذين شملتهم الدراسة للاحتكاك بعدد ١٠ أو أكثر من مرضى حمى الوادي المتصدع و ٢٠ (٢,٨ %) إلى الإصابة بجرح بالإبر، و ٩٨ (١٣,٩ %) بعمل وصله طرفية، و٨٠ (١١,٤ %) بأخذ عينات شريانية، و ٥٨ (٨,٣ %) بعمل ضماد للجروح، و ٣٧ (٥,٣ %) بإجراء إنعاش قلبي. عدد الذين تعرضوا لدم المرضى بدون اتخاذ إجراءات وقائية ٥٧ (٨,١ %) وللأدوات الطبية المستخدمة ٦٦ (٩,٤ %). بالنسبة لوسائل الحماية فكانت لبس القفازات الطبيه (٧٢,١ %) ثم قناع الوجه (٦٨ %) و الرداء الواقي (٦٠,٨ %). يتضح من النتائج أن قيام العاملين في المستشفيات بالممارسات الطبية المختلفة لمرضى حمى الوادي المتصدع لا تشكل خطورة عليهم، و يكتفى بالإجراءات الوقائية الأساسية.

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Risk Factors of RVF, cont....

(Continued from page 4)

community education to prevent future epidemics. Slaughtering animals was a significant risk factor, in case of which infection may occur as a result of injury or the possibility of airborne transmission.[1,2,3]

Educating the population in endemic areas of the importance of sleeping inside houses and spraying insecticides is recommended. Animal owners should be educated on the importance of keeping animals away from houses, immunizing them against RVF, immediate reporting to the local health authority if recurrent abortions or unexplained deaths occur among animals, the importance of wearing gloves during animal birthing, and proper disposal of abortuses or dead animals. We also recommend educating the public on the importance of boiling milk before drinking. Additional studies should be carried out to identify the role of mosquitoes in RVF transmission.

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Inside the Kingdom

November 6-8, 2001: The 9th Conference of the Union of Arab Pediatric Societies.
Host organisation and Location: Jeddah Chamber of Commerce.
Contact: Dr. AbdulAziz Al-Twaim. P.O.Box 40835, Jeddah 21511, KSA.
Tel: 966 2 6240000 Ext. 1244. Fax: 966 2 6240000 Ext. 2463.
E-mail: info@speda.org

Outside the Kingdom

December 2-4, 2001: 2nd New Zealand—Australia Health Services & Policy Research Conference.
Host organisation and Location: Victoria University of Wellington, New Zealand.
Conference information is available at http://www.vuw.ac.nz/hsrc/conf
Contact: Christine.parnell@vuw.ac.nz

February 25-27, 2002: IEA South East Asia Congress of Epidemiology: From Preventing Disease to Promoting Health.
Host organisation and Location: Maharani Laxmi Bai Medical College and Hospital, Jhansi (Uttar Pradesh), India.
Conference information is available at http://www.epidcong.8m.com
Contact: Organizing Secretariat. Division of Biostatistics. Dept. of Social and Preventive Medicine, MLB Medical College & Hospital, Jhansi (UP) - 284 128, India. Tel: 91 517 320492, or 91 517 321610. Fax: 91 517 320983 or or 91 517 320858. E-mail: blvmedstat@yahoo.com or epidcong@rediffmail.com

Selected notifiable diseases by region, Jan – Mar 2001

	Riyadh	Makkah	Jeddah	Taif	Madinah	Qassim	Eastern	Hasa	Hafr AlBatin	Asir	Bisha	Tabuk	Hail	Al Shamal	Jizan	Najran	Baha	Al Jouf	Goriat	Gonfuda	Total
Measles	5	9	0	0	2	1	0	1	0	0	0	0	2	1	8	0	0	0	0	0	29
Mumps	29	16	30	7	30	21	9	28	12	54	1	3	1	0	7	11	2	1	0	0	262
Rubella	1	11	1	0	2	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	17
Varicella	1441	322	991	283	417	513	1126	577	296	633	624	308	126	35	34	136	60	54	30	53	8059
Brucellosis	147	7	7	25	21	277	17	16	38	220	43	2	162	7	23	58	10	22	0	8	1110
Meningitis mening.	17	79	19	2	33	4	1	0	0	0	0	0	0	0	1	1	0	1	2	0	160
Meningitis, other	60	25	28	3	19	6	6	6	1	8	0	5	10	0	7	0	0	0	0	0	184
Hepatitis A	57	95	26	5	121	29	13	12	46	99	6	56	5	11	36	41	3	10	11	4	686
Hepatitis B	162	62	239	2	65	24	143	8	1	33	8	11	3	6	6	8	38	1	1	8	829
Hepatitis C	128	47	242	0	35	1	90	1	0	15	2	6	48	2	7	3	23	0	1	2	653
Hepatitis, unspecified	15	120	30	0	0	0	0	4	0	31	0	29	48	2	124	2	0	0	0	0	405
Typhoid & paratyphoid	15	8	1	0	18	0	12	1	0	9	0	2	13	2	1	0	0	0	0	0	82
Amoebic dysentery	33	0	415	15	8	19	19	7	0	94	24	5	3	0	19	10	0	0	5	1	677
Shigellosis	68	0	37	0	4	5	18	4	38	0	0	17	0	0	0	6	0	0	0	0	197
Salmonellosis	71	4	30	6	4	5	199	13	0	11	0	7	0	2	0	14	3	0	0	0	369
Syphilis	4	0	7	0	0	0	4	6	0	1	0	0	0	0	0	0	1	0	0	0	23
VD, other	5	0	41	0	0	0	13	31	0	3	0	0	0	0	9	0	0	0	0	0	102

Comparisons of selected notifiable diseases, Jan–Mar 2000-2001

	Jan-Mar	Jan-Mar	Change	Jan-Mar	Jan-Dec		Jan-Mar	Jan-Mar	Change	Jan-Mar	Jan-Dec
DISEASE	**2001**	**2000**	**%**	**2001**	**2000**	**DISEASE**	**2001**	**2000**	**%**	**2001**	**2000**
Diphteria	0	0	0	0	0	**Meningitis, other**	184	174	6	184	753
Pertussis	4	3	33	4	21	**Hepatitis A**	686	560	23	686	2250
Tetanus,	3	1	200	3	13	**Hepatitis B**	829	721	15	829	3361
Tetanus,	0	3	-100	0	10	**Hepatitis C**	609	389	57	609	2134
Poliomyeliti	0	0	0	0	0	**Hepatitis,**	405	301	35	405	1041
Measles	29	180	-84	29	617	**Typhoid/paratyp**	82	77	6	82	420
Mumps	262	492	-47	262	1388	**Amoebic**	677	856	-21	677	3244
Rubella	17	53	-68	17	202	**Shigellosis**	197	72	174	197	501
Varicella	8059	5383	50	8059	20076	**Salmonellosis**	369	266	39	369	2045
Brucellosis	1110	1096	1	1110	5320	**Syphilis**	23	28	-18	23	165
Meningitis,	160	151	6	160	337	**VD, other**	102	88	16	102	428

Diseases of low frequency, Jan – Mar 2001

Yellow fever, plague, diphtheria, poliomyelitis, rabies, puerperal sepsis, transverse myelitis, hemolytic uremic syndrome: No cases
Pertussis: 4 (Riyadh 2, Eastern 2)
Tetanus neonatal: 3 (Jeddah 2, Makkah 1)
Echinococcosis: 4 (Riyadh 4)
Guillain-Barre syndrome: 18 (Riyadh 5, Makkah 5, Jeddah 1, Madinah 1, Jizan 1, Tabuk 1, Hail 1, Baha 1, Hafr AlBatin 1, Qunfudha 1)