

## النشرة الوبائية السعودية

### تصدرها وزارة الصحة

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## Hepatitis E (HEV) among aborted and pregnant women in Maternity and Children's Hospital, Riyadh, 1995

Hepatitis E virus (HEV) infection is a known risk factor in pregnancy leading to high mortality due to fulminant hepatic failure in (10-20%) of cases, particularly in the third trimester (1,2). HEV is transmitted from infected mothers to their infants (vertical transmission) and causes significant prenatal morbidity and mortality (3).

The prevalence of anti-HEV in Saudi Arabia is estimated at 8-9% (4). Since there are no statistics about HEV in pregnant Saudi women, we conducted a case-control study of pregnant women, including those having abortions who were admitted to Maternity and Children's Hospital (MCH). The objectives of this study were to determine the association between having HEV and abortion and to identify the risk factors for acquiring HEV.

We collected information from medical charts upon admission, family medical files in primary health care centers (PHCCs), and through direct interviews with patients. Case-patients included women up to 22 weeks of gestation, who were having abortions and were admitted to MCH from 30/5/1995 to 13/7/1995. Control-patients were pregnant women in antenatal clinics who were more than 24 gestation weeks to be certain they exceeded the abortion period during the study. Blood samples were collected from all cases and controls. We used a standardized form to collect data on demographic characteristic, medical and family history, clinical symptoms on admission, previous abortions, obstetric history, contraception uses, gravidity and parity, and environment (water source, hygiene level, sanitation system, number of family members per room and bed, and travel history). Odds Ratios (OR) were calculated and P-value <0.05 was considered statistically significant.

(Continued on page 18)

### Index

Hepatitis E, continued .....	18
Watermelon and salmonellosis .....	19
Reports from the regions .....	20
Hepatitis A outbreak .....	21
SEB Arabic page .....	22
Calendar .....	23
Notifiable disease reports .....	24

# Hepatitis E (HEV) among aborted and pregnant women in Riyadh

(Continued from page 17)

The study included 204 women, 102 case-patients and 102 control-patients; 141(70%) were Saudi and 63 (30%) were non-Saudi. The median age was 31 years (range 15-46 years). The median week of gestation for cases was 12 (range 6-22 weeks); the median week of gestation for controls was 33 (range 27-39 weeks). The median number of abortions was 1 (range 0-12); 63 % of the abortions occurred in the first trimester and 19% occurred in the second trimester. The median gravidity was 5 (range 1-17) and the median parity was 4 (range 0-12). There were 10 (4.9%) stillbirth and 19 (9.3%) prenatal deaths.

Anti-HEV was positive in 22 of cases and in 9 of controls (OR=2.8, 95%CI=1.15-7.16, P-value = 0.01). These positive HEV cases were free

from rubella, toxoplasmosis, or any other cause of abortion. After stratification in univariate analysis, there was a statistically significant association between having one abortion or more and having anti-HEV (OR=8, 95% CI=1.5-58, P-value=0.002).

The use of IUCD as a contraceptive, use of traditional medicine, habitual abortion, and history of blood transfusions were statistically significant (Table 1).

Regarding the risk factors, drinking water from jerry cans and living in houses which reported having insects and flies, or sewage leaks in the area were associated with having anti-HEV, while households which employed servants were protected against having HEV (Table 2).

—Reported by: Shadia E. Al-Soudani, Dr. Nasser A. Al-Hamdan, Dr. R. E.

Fontaine, (Saudi Arabian Field Epidemiology Training Program) Dr. Ilham qattan, Dr. Awwad S. Abdulgafar, Dr Mohmad Arif (Laboratory Investigation Assistant, RMC). Dr Adnan Turkistani, Maternity Hospital, Riyadh, and Ibrahim Dardeer, Abbott Diagnostic products, Riyadh.

**Editorial note:** This study is the first to describe the prevalence of antibodies against HEV and its effects on pregnant women in Saudi Arabia. Our findings indicate that HEV IgG was significant and associated with abortion. The association between having HEV and history of one or more abortions was not confounded by habitual abortion or other risk factors. But, here we can not confirm if these cases were infected in the past or acquired recently. It is not clear how long after infection these antibodies persist, therefore it is not known whether the antibody positively represents infection in the recent or distant past (5). HEV IgM is not commercially available and is still under trial, however the persistence of antibodies to HEV has still to be determined (4).

Having a servant in the houses was protective; this is perhaps because the level of hygiene in a house with a servant is higher than in a house without one. Having anti-HEV is related to the level of hygiene at home and for drinking water.

Studies should be conducted to determine the association between having HEV and stillbirth, since hepatitis E is a higher risk if it occurs in the third trimester. Our study deals only with abortion, so women more than 24 gestation weeks were excluded from this study. Further analytical studies should be carried out in KSA to clarify the public health importance of HEV. Anti-HEV testing should be on a routine diagnostic basis and should be part of screening tests for any pregnant women. Emphasis should be placed on educating the public about proper hygiene levels for homes and surrounding areas and the use of insecticides for keeping insects and flies away. People need to be informed that

(Continued on page 23)

**Table 1. Univariate analysis of selected variables that lead to abortion, Riyadh, 1995**

Variables	Cases (Aborted)		Controls (Pregnant)		OR	95% CI	P-value
	Exp.	Not Exp.	Exp.	Not Exp.			
<b>Contraceptive use</b>							
IUCD	20	82	7	95	3.3	1.2-9	0.007
oral	32	70	36	66	0.84	0.4-1.5	0.5
<b>Traditional medicine</b>	46	56	22	80	3	1.5-5	0.0003
<b>Habitual abortion</b>	22	80	6	96	4	1.5-12	0.001
<b>Blood transfusion</b>	15	87	6	96	2.7	0.94-8.4	0.03

**Table 2. Risk factors associated with having HEV among pregnant women, Riyadh, 1995**

Risk Factors	Cases (aborted)		Controls (pregnant)		OR	95% CI
	HEV+	HEV-	HEV+	HEV-		
<b>Drinking water</b>						
Piped	15	49	4	76	0.74	0.3-1.6
Jerry can	10	11	5	4	7.6	3.1-18
bottled	4	32	3	35	0.4	0.19-1.14
<b>Sewage system</b>						
public	14	59	6	79	0.5	0.2-1.2
Sewage leakage	7	11	3	5	3.8	1.5-9.6
<b>Houses with</b>						
Flies	15	47	5	33	1.7	0.7-3.8
Insects	13	23	4	11	4.9	1.8-9.2
<b>Servant</b>	4	38	2	61	0.2	0.08-0.5

# Watermelon and Salmonellosis Outbreak in a Handicapped Institution, Madinah, July 1998

On July 23, 1998, an outbreak of food poisoning occurred among the residents and workers of a Social Rehabilitation Center (SRC) in AlMadinah City. SRC is a governmental institution where severely mentally retarded and physically handicapped Saudis live. A retrospective cohort study was conducted to identify the source, the extent of the problem, and to suggest recommendations that would prevent occurrence of similar outbreaks in the future.

A case of food poisoning was defined as any person who ate food prepared at the SRC kitchen between July 21–23, 1998 and developed diarrhea, vomiting, or abdominal pain with or without fever between July 23–26, 1998. At the time of the outbreak, 256 Saudi handicapped residents were living at the center. The residents are divided into two sections, one for males, the other for females. A list was obtained of all residents, escorts, and other workers at the SRC in the two sections.

All members of the SRC community were interviewed whether they experienced any of the symptoms of food poisoning or not. Stool specimens and rectal swabs were taken from 27 patients who were admitted to hospitals. The summary discharges of the medical records from the hospital were reviewed to verify the reported symptoms, to determine the period of hospitalization, and to review the results of the laboratory investigations. The kitchens and the dining halls of the SRC were visited. Details on preparation of foods and drinks were collected.

To implicate a specific meal, the Attack Rate percentage (AR) was calculated for nine suspected meals served on the 3 days before the outbreak. Among 379 persons who usually take meals at the SRC, 125 were identified as cases of food poisoning, Attack Rate (AR) =33%. Of those, 93 cases (74.4%) were admitted to hospitals,

56(44.8%) had diarrhea, vomiting, and fever, 40 (32.0%) had two of the symptoms, and 29 (23.2%) had one of the three symptoms mentioned above and also abdominal pain.

Although all meals were prepared in the same kitchen (male section), the AR in the male section was 84.5%, whereas there were no cases in the female section (AR =0.0 %).

Of all nine meals served during the 3-day period prior to symptom onset, the outbreak was associated with watermelon served at lunch on 23/07/98 (AR =42.8, 95% CI =37.2-48.5). In the male section, 148 persons had some watermelon and 125 (84.5%) had symptoms of food poisoning. Out of 125 cases, 122 (84.1%) had watermelon as a juice and 3 had watermelon slices. *Salmonella enterica* serogroup *enteritidis* was isolated from 21 patients. Symptoms started to appear five hours after eating lunch and continued to appear over a 24-hour period after eating the implicated

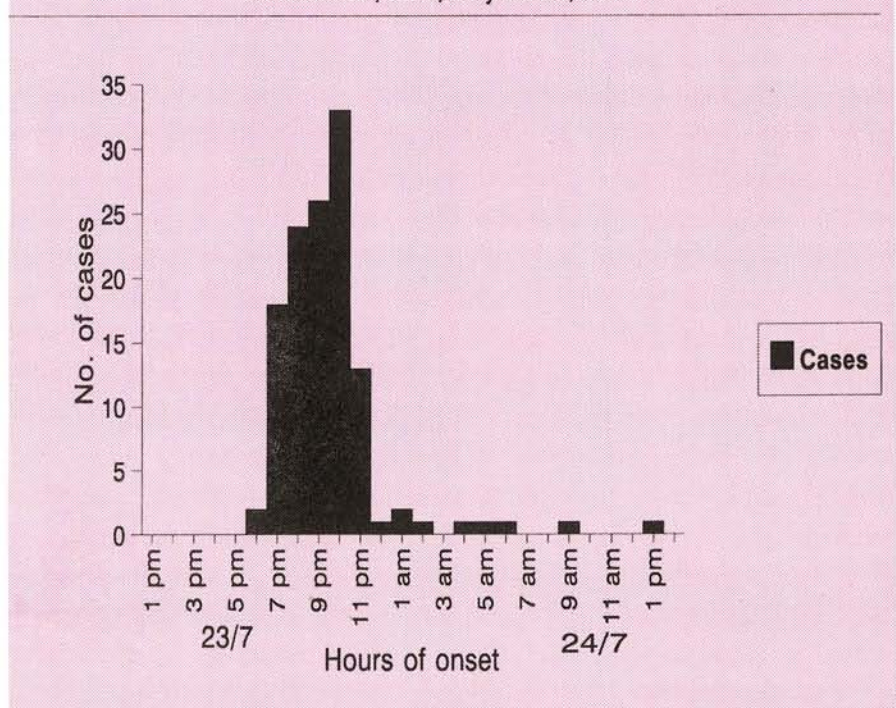
lunch (Figure 1). The lunch was served on July 23 at 1 pm. The median incubation period was 8 hours, the Inter Quartile Range (IQR) =7–9 hours. The duration of the incubation period was associated with amount of the watermelon consumed.

Both the knife and cutting board used to slice the watermelon had been used to cut more than 120 raw chickens served the day before the outbreak. The sliced watermelon was kept at room temperature for at least 2 hours before blending at mid-day.

—Reported by: Dr. Abdullah M. Al-Rabeah, Dr. Hassan El-Bushra, (Saudi Arabian Field Epidemiology Training Program, Saudi Arabian Ministry of Health)

**Editorial Note:** This outbreak documents an uncommon vehicle for salmonellosis: watermelon. There are

Figure 1: Outbreak of food poisoning in the Social Rehabilitation Center Al-Madinah, KSA, July 23-26, 1998



# Watermelon and Salmonellosis Outbreak in a Handicapped Institution

(Continued from page 19)

only a few reported food poisoning outbreaks due to *Salmonella* spp. implicating watermelon, cantaloupe, or melon (1). Gayler et al. (1993) reported that *Salmonella miami* and *Salmonella bareilly* were responsible for two salmonellosis outbreaks associated with precut wrapped watermelon. It has been shown that interior watermelon tissue could become contaminated if *Salmonella* was present either on the rind of the watermelon or on the knife used for slicing (2).

It is most likely that these watermelons were contaminated while they were sliced on a dirty cutting board. Being kept at room temperature in an already warm kitchen probably favored overgrowth of bacteria. The blending of watermelon could explain the high AR observed in this study. Blending created a contaminated homogeneous liquid whereas the slices were probably only partially contaminated on their surfaces. This could also explain why those who ate watermelon slices had a relatively longer incubation period.

Having the watermelon sliced on an unclean cutting board demonstrates how inadequate hygienic practices during food handling play a major role in food poisoning outbreaks.

These inadequate practices are repeatedly implicated in literature as important causes of food poisoning outbreak (3). The dangers are increased in food services that prepare a limited number of food items for large numbers of people. *Salmonella* can survive for long periods of time on or in foods not commonly implicated in outbreaks of salmonellosis, such as cheese and sliced fresh fruit. Relatively small doses of *Salmonella* have been shown to cause illness in an outbreak setting (4).

Meat cutting boards should never be used for preparing other food items. Routine inspection of kitchens and improved practices by food handlers is highly recommended.

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outbreak of salmonellosis traced to watermelon. Public Health Rep.70:311-13.

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## Reports from the regions

### Diabetes Millitus, Hypertension distribution and effect of mini clinics, 1998-1999

At 15 primary health care centers (PHCCs) in one sector of Riyadh, we conducted a study to identify the distribution of diabetes mellitus (DM) and hypertension (HT) and the effect of mini clinics on the proper management of patients. The data were collected from files in the chronic disease clinic over a 2-year period (1998 to 1999).

In this period, the prevalence rate per 100,000 for DM and HT increased from 2.06 to 2.3 and 1.25 to 1.34 respectively. Comparing the results of DM and HT over the 2 years, we

found a positive effect of mini clinics on the quality of care for the patients (Table 1).

We need to strengthen the role of mini clinics to provide the high quality of care given to the patients in the PHCCs. We also need to adopt effective follow-up programs and health education.

—Reported by: Dr. Saud N. Al-Sahli, Primary Health Care Specialist, and General Directorate of Health Affairs, Riyadh Region.

**Table 1: Data of Diabetes Millitus and Hypertension patients, Riyadh City, 1998-1999**

Year	1998		1999	
	DM	HT	DM	HT
Registered patients	3280	1591	3642	2187
Complete file data	2693	1428	3283	2091
FBS every visit*	2544	-	2680	-
BP measured 3 times**	-	1466	-	1512
Annual check-up	1816	936	2240	1433
Weight every visit	2877	1448	3247	1768
BP every visit	-	1469	-	2042
6 or more periodic visits	2012	941	1825	1164

\* Fasting blood sugar (FBS) for DM patients

\*\* Blood pressure (BP) for HT patients

# Hepatitis A outbreak in Mashash Awadh village, Majmaah district, Riyadh region, Mar 25-May 10, 1999

An unusual increase of Hepatitis A cases from Mashash Awadh village, Majmaah district, Riyadh region, was identified through surveillance from Apr. 25- May. 10, 1999. An epidemiological investigation was identified to estimate the extent and size of the outbreak, and to identify its source and mode of transmission.

A case of hepatitis A was defined as an onset of jaundice in a resident or a visitor of Mashash Awadh village between Mar. 25 and May. 10, 1999.

Affected families were interviewed about common exposure to other cases and common foods. A case-control study was conducted of 26 case-persons. Two control-persons for each case-person were selected from the nearest neighboring household and matched for age allowing a difference of 2 years.

Twenty-seven outbreak-associated cases of hepatitis A were detected through both passive and active case-findings. Of these, 26 were Mashash Awadh residents (attack rate [AR] =6.4%). Only one case (index case); was a six year old Saudi girl who came from another village to visit her aunt in Mashash Awadh while in the infective stage of hepatitis A (she became jaundice 3 days after her arrival). Of the 26 Mashash Awadh cases, only 1 (the co-index case) was a relative of the index case.

The outbreak began during the eleventh international week; cases increased to a peak number by the seventeenth international week (Figure 1). The index and co-index cases knew each other (cousins). The other cases lived near to each other. The outbreak was preceded by the index and co-index cases. Twenty-five cases appeared from the seventeenth to the nineteenth international week.

A gathering banquet, where the cases shared food from the same plate and drank water from the same bowl with the co-index case, was performed at the end of the fourteenth international week. The 1-5-year-old age group had the highest AR (3.9%). All cases were in pre-school age children. Interviews revealed common exposure of affected families to other hepatitis

A cases, common meals and eating-places.

The risk of having Hepatitis A virus among cases who did not wash their hands after meals was ten-fold more than that of the control-persons. All cases and controls used the same sources of drinking water.

Three samples were taken from three different case-patient households; the testing of these samples found no organisms. Both overall socioeconomic and sanitation status were poor for Mashash Awadh village residents. A common-source outbreak of hepatitis A, through sharing food with the co-index case in a gathering banquet, was probably responsible for this outbreak.

—Reported by Dr. AbdulRahman A. Al-Khan and Dr. Mohammed A. Al-Mazroa (Saudi Arabian Field Epidemiology Training Program, Ministry of Health)

**Editorial note:** Although hepatitis A is normally transmitted person-to-person and appears as propagated pattern. Point or common-source outbreaks have been associated with food, water and milk (1,2). This outbreak of hepatitis A occurred suddenly with a rise to a peak. Interviews indicated that A common-source outbreak of hepatitis A, through sharing food with the co-index case in a gathering banquet, was probably responsi-

ble for this outbreak. Sanitary and hygiene practices have to be improved to eliminate fecal contamination of food and water for Mashash Awadh village. An additional field epidemiology survey is recommended to investigate the village of the index case for the possibility of similar illnesses. .

Many outbreaks of hepatitis A occurred in North America and Europe (3). These outbreaks were spread through person-to-person transmission. Other outbreaks were associated with a contaminated food and water.

In Saudi Arabia, outbreaks of hepatitis A were reported from rural water systems and food contamination. This is the first outbreak that has been investigated in this village.

Many microorganisms (cholera, *Cryptosporidium*, *Compylobacter spp*, *Cyanobacteria*, *Escherichia coli*, *Enteroinvasive E.coli*, *Shigella*, *Salmonella*, *Giardia lamblia*, protozoa parasites, hepatitis E and hepatitis A) that cause diseases are transmitted through a fecal-oral route.

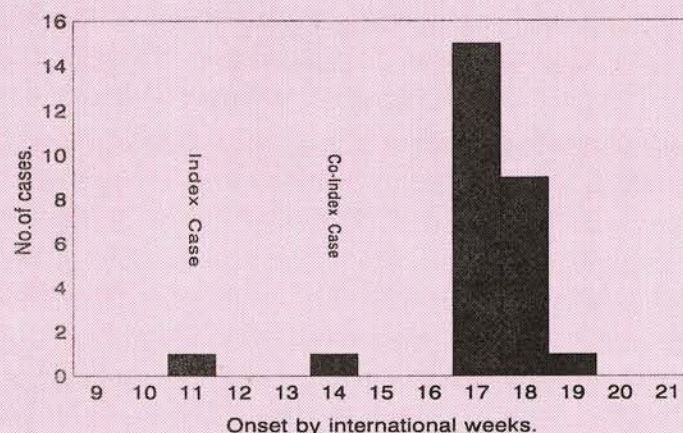
Sanitary and hygiene practices have to be improved to eliminate fecal contamination of food and water for Mashash Awadh village. An additional field epidemiology survey is recommended to investigate the village of the index case for the possibility of similar illnesses.

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(Continued on page 23)

Figure 1: Onset of hepatitis A outbreak by international weeks  
Mashash Awadh village, 1999



التهاب الكبد (E) بين حالات الحمل والإجهاض، الرياض ١٩٩٥

التهاب الكبد (E) من الأمراض الشائعة عالمياً لا سيما في الدول النامية. ينتقل المرض عن طريق الفم بواسطة الأطعمة والمياه الملوثة، كما أثبتت الدراسات خطورته على المرأة الحامل والجنين خاصة في الشهور الأخيرة من الحمل. وبما انه لا توجد دراسات سابقة عن أثره على النساء الحوامل والمجهضات في المملكة لذا قمنا بعمل دراسة مقارنة للتعرف على عوامل وأسباب هذا المرض. تمت هذه الدراسة في مستشفى الولادة والأطفال حيث تم سحب عينات دم من حالات الحوامل وجميع الحالات المجهضة التي تم تنويمها في المستشفى خلال فترة الدراسة من ١٩٩٥/٥/٣٠ إلى ١٩٩٥/٧/١٣.

شمل البحث ٢٠٤ حالة منها ١٠٢ حامل و ١٠٢ إجهاض تتراوح أعمارهن بين ١٥-٤٦ (بمتوسط ٣٣ سنة). كانت هناك علاقة بين حدوث الإجهاض لأكثر من مرة وشرب المياه الغير مرخص لها (معامل الشذوذ= ٠,٠٠٢ لكل منهما) ووجود الحشرات المنزلية (معامل الشذوذ= ٠,٠٠٣) وبين الإصابة بالفيروس. كما كان وجود الخادمة وشرب الماء من الصنبور عوامل حماية (معامل الشذوذ= ٠,٠٠١).

نستنتج من هذه الدراسة أن إدراج فحص فيروس التهاب الكبد E ضروري لأي حامل كما يجب الحث على نظافة المسكن والمأكّل.

إعداد: شادية السوداني  
برنامج الوبائيات الحقلية

التسمم الغذائي في مركز التأهيل الاجتماعي. المدينة المنورة، ١٩٩٨م

في يوم الخميس ١٩٩٨/٧/٢٣م تعرض مجموعة من نزلاء وعاملي مركز التأهيل الاجتماعي لنزلات معوية. من هنا قام فريق من برنامج الوبائيات الحقلية بعمل التقصي الوبائي لمعرفة حجم ومصدر المشكلة لوضع التوصيات التي تمنع تكرارها مستقبلاً. بلغت حالات التسمم ١٢٥ حالة أصيبت جميعها بالإسهال، كما ظهرت أعراض القيء وآلام البطن وارتفاع درجة الحرارة على ٦٠٪ منها. تم عزل ميكروب السالمونيلا من ٢٢ مصاباً، عمل ١٢٤ منهن تحديد نوعي. أظهرت نتائجها أنها سالونيلا انتريكتيس. بعد زيارة مطبخ المركز لوحظ تدني مستوى النظافة. ثم تم حساب معدل الخطورة لجميع أصناف الأطعمة المقدمة خلال الأيام الثلاثة السابقة لحادثة التسمم وتبين أن البطيخ هو غالباً سبب التسمم وذلك لارتفاع معدل الإصابة بين جميع من تناولوا عصير البطيخ أو قطع منه. بينما لم يصب من لم يتناوله بأي عرض. أتضح من سؤال الطباخ أنه يقوم عادةً بوضع ما يقارب من ١٢٠ دجاجة مجمدة في الماء ويتركها لتذوب ثم يبدأ بتقطيعها. إن تقطيع البطيخ بنفس السكين ولوح التقطيع الذي تم تقطيع الدجاج عليه قد يكون تسبب في نقل السالمونيلا إلى البطيخ. كما أن تركه لأكثر من ساعة بعد تقطيعه حتى يتم عصره في درجة حرارة مطبخ عالية (٤٧ درجة مئوية) وإدخاله ثلاجة ضعيفة التبريد أدى لتكاثر السالمونيلا بسرعة كبيرة.

إعداد: د. عبد الله بن محمد الربيعية  
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الالتهاب الكبدي الوبائي أ في قرية مشاش عوض. ١٩٩٩

ينتقل التهاب الكبد أ عادة إما من شخص لآخر أو عن طريق مصدر ملوث مشترك للأكل أو للشرب. في الفترة ما بين ٩-٢٤ محرم، ١٤٢٠هـ تم اكتشاف ٢٧ حالة لالتهاب الكبد أ في قرية مشاش عوض بمنطقة الرياض وقد قام فريق من برنامج الوبائيات الحقلية بعمل الاستقصاء الوبائي لهذه الحادثة للتعرف على حجمها ومصدرها لطرح المقترحات المناسبة للحد من تكرارها مستقبلاً. أظهرت الدراسة أن ٢٦ من الحالات تعيش في القرية (معدل الإصابة ٦٠,٤٪) وحالة واحدة (الحالة المسببة) في طور العدوى للمرض كانت زائرة من قرية أخرى حيث انتقل المرض إلى قريبتها (الحالة المسببة المشاركة) وذلك بعد أسبوعين من الزيارة. و بعد أكثر من أسبوعين من إصابة الحالة المسببة المشاركة أكتشفت ٢٥ حالة أخرى مصابة. وقد تبين أن سبب هذه الحادثة هو تناول الحالة المسببة المشاركة الطعام مع بعض أطفال القرية في مأدبة جماعية أقيمت حيث جرت العادة في مثل هذه المناسبات أن يتناول الأطفال الطعام في إناء واحد ويشربون الماء من قدر واحد. إن توفير المياه النظيفة و تفعيل التثقيف الصحي للفرد والمجتمع عن ما يسببه تناول الطعام الملوث من أضرار لا تحمد عقبها دوراً كبيراً للحد من ظهور كثير من حالات الالتهاب الكبدي الفيروسي أ.

إعداد: د. عبدالرحمن عبد القادر الخان  
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# Hepatitis E

(Continued from page 18)

drinking water must not be bought from unmonitored stations and emphasize the importance of proper handling and storage of water.

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## Mark your calendar . . .

### Outside the Kingdom

**Sep.7-10,2000:** 38th Annual Meeting of the Infectious Diseases Society of America, New Orleans, USA. Contact: IDSA Customer Service at (800)375-25-2586, Fax (617)876-5351 or E-mail: IDSA@dbpub.com.

**Oct.23-25, 2000:** 5th IEA Eastern Mediterranean Regional scientific Meeting, Bahrain. Contact: Conference Sec., PO Box 22118, Bahrain. Phone: (+973)246341, fax (+973)258221, E-mail: faaameen@batelco.com.bh, Web site: <http://zurba.com/conf/iea5>.

**Oct.29-Nov.2,2000:** 49th Annual Meeting, American Society of Tropical Medicine and Hygiene, Washington, DC, USA. Contact: ASTMH, 60 Revere Dr., Suite 500, Northbrook, IL 60062 USA. Phone: (847) 480-9592, Fax: (847) 480-9282, E-mail: [astmh@astmh.org](mailto:astmh@astmh.org) or [www.astmh.org](http://www.astmh.org). Online submission: <http://abstract.cornetser.com/>.

(Continued from page 21)

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The *Saudi Epidemiology Bulletin* welcomes reports from the regions. Please send your reports to the address shown. Thank you.

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## Selected notifiable diseases by region, Jul - Sep 1999

	Riyadh	Makkah	Jeddah	Taif	Madinah	Qassim	Eastern	Hasa	Hafr Al Batin	Asir	Bisha	Tabuk	Hail	Al Shamal	Jizan	Najran	Baha	Al Jouf	Goriat	Gonfuda	Total
Measles	63	5	24	4	22	26	7	3	16	8	17	4	17	3	4	0	3	17	6	1	250
Mumps	33	16	115	8	56	33	32	13	11	26	7	5	6	2	10	11	10	7	5	0	406
Rubella	5	9	5	1	2	9	5	0	1	2	1	1	0	0	4	0	0	0	1	0	46
Varicella	550	59	382	101	120	234	713	416	64	264	110	87	45	26	0	100	25	12	44	7	3359
Brucellosis	133	17	16	66	37	367	38	33	48	277	101	11	232	12	61	97	26	49	1	7	1629
Meningitis, mening.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meningitis, other	45	13	16	8	5	12	3	8	2	10	0	0	1	2	12	1	4	0	0	0	142
Hepatitis A	52	37	30	0	54	42	45	23	33	86	4	9	9	2	39	67	3	22	43	1	601
Hepatitis B	128	75	197	0	48	27	189	5	0	31	19	6	17	1	5	9	50	2	0	0	809
Hepatitis C	52	63	200	0	16	11	84	8	2	6	6	2	3	0	2	4	48	0	0	1	508
Hepatitis, unspecified	9	14	31	0	0	0	2	8	0	45	0	17	29	0	52	7	0	0	0	0	214
Typhoid & paratyphoid	17	6	4	3	1	0	16	9	1	5	1	8	9	0	2	0	0	0	0	0	82
Amoebic dysentery	14	5	517	10	1	25	21	9	0	250	16	11	0	0	11	46	0	0	2	0	938
Shigellosis	5	0	14	0	7	2	24	1	7	0	1	21	0	0	0	35	0	0	0	0	117
Salmonellosis	134	4	68	40	6	2	365	27	25	11	0	120	0	0	0	27	3	0	0	0	832
Syphilis	20	4	18	0	0	0	17	5	0	0	1	0	0	0	10	0	0	0	1	0	76
VD, other	5	2	53	0	0	0	19	43	1	6	3	0	0	0	2	0	0	0	2	0	136

## Comparisons of selected notifiable diseases, Jul- Sep1998-1999

	Jul-sep 1999	Jul-sep 1998	Change %	Jan-sep 1999	Jan-Dec 1998		Jul-sep 1999	Jul-sep 1998	Change %	Jan-Sep 1999	Jan -Dec 1998
Diphtheria	0	0	0	0	0	Meningitis, other	142	148	-4	443	629
Pertussis	4	32	-88	10	85	Hepatitis A	601	756	-21	1867	3350
Tetanus, neonatal	3	1	200	6	10	Hepatitis B	809	866	-7	2277	3411
Tetanus, other	6	1	500	6	11	Hepatitis C	508	447	14	1253	1420
Poliomyelitis	0	0	0	0	1	Hepatitis, unspec.	214	237	-10	717	1253
Measles	250	1522	-84	2653	5519	Typhoid/paratyph.	82	87	-6	295	280
Mumps	406	732	-45	1804	3762	Amoebic dysentery	938	907	3	2729	3821
Rubella	46	81	-43	251	361	Shigellosis	117	87	34	412	628
Varicella	3359	3705	-9	18891	22473	Salmonellosis	832	738	13	1732	2383
Brucellosis	2244	2039	10	5896	7468	Syphilis	76	66	15	160	243
Meningitis, mening.	0	4	-100	21	42	VD, other	136	100	36	331	401

## Diseases of low frequency, Jul - Sep 1999

Yellow fever, plague, diphtheria, poliomyelitis, viral encephalitis, rabies, haemolytic ureamic syndrome, , transverse mylitis: No cases

Pertussis: 4 (Makkah 2, Jeddah 1, Asir 1)

Tetanus neonatal: 3 (Makkah 2, Jazan 1)

Tetanus, other: 6 (Makkah 2, Jeddah 2, Jazan 1, Gonfuda 1)

Guillain-Barre syndrome: 12 (Riyadh 4, Jeddah 3, Jazan 3, Hasa 1, Goriat 1)

Echinococcosis: 3 (Riyadh 1, H. Batin 2)

puerperal sepsis: 1(Riyadh 1)