Short Communication

The Incidents of Human Brucellosis in Al-Ahsaa area, Saudi Arabia

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Abstract:
Brucellosis is worldwide zoonotic disease. In Saudi Arabia the disease is endemic in almost all the country. The records of human brucellosis in the past five years (2000-2004) were examined to evaluate the extent of the incidents in Al-Ahsaa area. The study examined the possible impact of the compulsory vaccination program which was enforced by the Ministry of Agriculture in reducing the human brucellosis. The records of the years 2000-2004 of human brucellosis was obtained from the Department of Preventive Medicine, Al Ahsaa Health Authority on basis of Age, Sex, Nationality and locations of Al Ahsaa area. The analysis of variance indicated a significant reduction in brucellosis incidents (P > 0.001) by year 2004. The incidents of human brucellosis was significantly (P > 0.01) higher in males than females. Al-Solimanieh and Al-Arquiqah, a two different locations in Al Ahsaa area, recorded the highest percentage of human brucellosis.

This is the first study that report the human brucellosis in Al Ahsaa area and has confirmed the continuation of brucellosis incidents in Al-Ahsaa area. However, the rate of the disease has decreased with years. The significant decrease in the brucellosis incidents could be due to the enforcing of the vaccination program. The results urge for the stringent enforcement of the animal vaccination program to prevent the transmission of the disease to humans.

Key Words: human brucellosis, Al-Ahsaa, vaccination, Saudi Arabia
Human Brucellosis is a worldwide zoonotic disease with half million new cases annually (Pappas, 2006). The annual prevalence rate of the disease could exceed ten cases per 100,000 (Franco, 2007). Five of ten countries in Asia were reported with highest incidence for human brucellosis. Syria has the highest annual incidence worldwide reaching 1603 cases per million per year followed by Turkey 15000 cases in 2004. In Kuwait, however, the incidents remained still for 20 years ago, 500 case per million (Pappas et al., 2006). In Saudi Arabia, a national survey stated that the prevalence rate in human brucellosis reached 40 cases per 100,000 (Memish, 2001). However, the incidents rate has been reduced to 16.89/100,000 in 2006 (Ministry of Health Annual Report, 2006).

Human brucellosis is a multisystem disease with multi-facets clinical symptoms. The disease is either acute or insidious. The typical clinical sings of human brucellosis are fever, splenomegaly, lymphadenopathy and myalgia (Memish and Venkatesh, 2001; El-Eissa, 1999). Human brucellosis is associated with both humoral and cellular immunity. Although antibody responses play certain role in resistance to brucellosis, cell-mediated immunity (CMI) appears to be the principal mechanism of recovery (Araj et al., 1986; Doganay, 2003).

Previous studies on human brucellosis in Saudi Arabia indicated that the disease incidents recorded a critical points when the reported cases reached 8000 cases (22.5%) (Elfaki et al. 2005; Memish and Venkatesh, 2001). The disease was reported in Central (Cooper, 1991) Northern (Fallatah et al. 2005) Southern (Malik, 1997; Alballa,1995) Saudi Arabia. Several occupations are the major target of human brucellosis in Saudi Arabia. Brucellosis is considered a major threat for the laboratory workers of the Saudi hospitals (Kiel and Khan, 1993; Memish and Mah, 2001). A study on 1290 abattoir workers indicated that human brucellosis among the veterinarian and veterinary assistants was 5.4%, butchers 8.9% and 1.1% among the administrative personnel (Alsekait, 1993).

Control of human brucellosis in Saudi Arabia is hindered by the importation of thousands of livestock especially during Hajj (Pilgrimage) season each year. The imported livestock are usually allowed without proper verification on brucellosis (Memish, 2001; Al-Eissa, 1999).

The major routes of transmission were shown to be due to drinking of raw milk of infected animals and direct contact with infected animals (Al-Sekait, 1999, Ministry of Health Annual Report, 2006). The major route of transmission among the hospital employees were processing of brucella
cultures or dealing with infected body fluids (Kiel and Khan, 1993; Memish and Mah, 2001).

The aim of this study was to reveal the actual incidents of human brucellosis in Al Ahsaa area especially after the application of the compulsory vaccination program which was enforced by the Ministry of Agriculture since 1993. This retrospective study was also considered necessary to evaluate the influence of urbanization in the Al Ahsaa area in the last years on the incidents of human brucellosis.

The incidents of human brucellosis of the five consecutive years, 2000-2004, were retrieved from the records of the Department of Preventive Medicine, Al Ahsaa health authority. The data were classified according to age, sex, nationality and locations at Al Ahsaa area. The statistical analysis was performed using SPSS software (SPSS Inc.). The significant differences in the data were examined using the analysis of variance.

The incidents of human brucellosis indicated continuous decrease since year 2000. The analysis of variance on the brucellosis incidents between 2000-2004 indicated significant decrease (P>0.001) by year 2004. The details of human brucellosis according to age, sex and nationality are recorded in Table-1. The incidents of brucellosis in the last five years were significantly higher among males (P> 0.01) and was restricted to the people between 26-35 years old. The incidents in year 2000 were the highest (94) whereas the incidents in year 2004 were the lowest (37). No distinct variation in the incidents was recorded between the Saudi and the non-Saudi nationals.

**Table (1)**
The human brucellosis incidents in the Al Ahsaa area based on Age, Sex and Nationality from 2000 - 2004

<table>
<thead>
<tr>
<th>Year</th>
<th>Patient No</th>
<th>Median Age</th>
<th>Median Age</th>
<th>Range</th>
<th>Sex</th>
<th>Nationality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>2000</td>
<td>94</td>
<td>30</td>
<td>28.7</td>
<td>1.6-85</td>
<td>81</td>
<td>13</td>
</tr>
<tr>
<td>2001</td>
<td>56</td>
<td>29</td>
<td>28.97</td>
<td>1-99</td>
<td>44</td>
<td>12</td>
</tr>
<tr>
<td>2002</td>
<td>41</td>
<td>36</td>
<td>25.4</td>
<td>2-56</td>
<td>32</td>
<td>9</td>
</tr>
<tr>
<td>2003</td>
<td>30</td>
<td>35</td>
<td>32.75</td>
<td>3.6-55</td>
<td>23</td>
<td>7</td>
</tr>
<tr>
<td>2004</td>
<td>37</td>
<td>37</td>
<td>6-72</td>
<td>29</td>
<td>8</td>
<td>23</td>
</tr>
</tbody>
</table>
Al-Solimanieh and Al-Arquiqah were the two locations in the Al Ahsaa area that recorded the highest incidents of brucellosis (Table-2).

The current study examined the incidents of human brucellosis in the last five years in the Al-Ahsaa area. The disease according to the current data recorded consecutive reduction in Al-Ahsaa area during the last five years (2000-2004). Unfortunately, no previous study was conducted on the human brucellosis in the Al Ahsaa area to be compared with the current data. Hence, this study can be considered the first to record the human brucellosis in the Al-Ahsaa area. The significant reduction in human brucellosis in the Al-Ahsaa area correlates with the national reduction of the disease incidents. The incidents of the human brucellosis has dropped from 21.87 per 100.000 in 2002 to 16.89 per 100.000 in 2006 (The ministry of Health Annual Report, 2006). Nevertheless, reports of brucellosis incidents in 2006 in different regions of the country were considerably higher than the Al-Ahsaa. The incidents of brucellosis in Aseer, Qaseem, Hail, Riyadh and Al-Ahsaa were 757, 652, 531, 475 and 37, respectively (The ministry of Health Annual Report, 2006).

### Table (2)

<table>
<thead>
<tr>
<th>Number</th>
<th>Place of living</th>
<th>Number of Cases</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Al-Solimanieh</td>
<td>40</td>
<td>18%</td>
</tr>
<tr>
<td>2</td>
<td>Al-Arquiqah</td>
<td>35</td>
<td>16%</td>
</tr>
<tr>
<td>3</td>
<td>Al-Mahasin</td>
<td>19</td>
<td>8.7%</td>
</tr>
<tr>
<td>4</td>
<td>Al-Guiabih</td>
<td>18</td>
<td>8.2%</td>
</tr>
<tr>
<td>5</td>
<td>Al-Kaldiah</td>
<td>14</td>
<td>6.4%</td>
</tr>
<tr>
<td>6</td>
<td>Al-Askan</td>
<td>13</td>
<td>5.9%</td>
</tr>
</tbody>
</table>

The significant reduction in the incidents of human brucellosis could be due to several factors. The Ministry of Agriculture compulsory vaccination program could be considered as one of the major factors that had plausible impact on reduction of human brucellosis. Since 1993, the authorities of Ministry of Agriculture at different parts of Saudi Arabia enforced a compulsory vaccination law on all animals at risk of infection. Although data on the stringency and comprehensive application on this program are not available, the effect of the program in reducing the incidents of human brucellosis can not be ruled out. Increase in the public health awareness in the last years has had tangible impact on reducing the habits of drinking raw
milk and unsafe contact with the infected animals. Majority of the cases referred to in this study were mainly related to nomads or their expatriate shepherds who seems did not deal with precautionary measures, vaccination, drinking raw milk and animal handling with up most stringency. The continuous practice of unsafe lifestyle with the infected animals could stands behind the increase in the brucellosis incidents in the two locations of Al Ahsaa area, Al-Solimanieh and Al-Arquiqah. The residents of these tow locations are mainly of nomadic origin who were settled in Al Ahsaa many years ago. Despite their settlement, they still own flocks of camel and sheep. Hence, it is not surprising that the brucellosis incidents were higher in these locations than other parts of Al Ahsaa area.

The study indicated higher brucellosis incidents in male than female in the Al-Ahsaa area. Study on human brucellosis in the northern Saudi Arabia was also confirmed the high brucellosis incidents among male than female in a ratio of 1.7:1, whereas, in Tabuk (Northwest) the ratio was 1.8:1 (Fallatah et al., 2005, Elbeltagy, 2001). The high incidents of brucellosis in male was also reported in Egypt, 70% (Jennings, et al., 2007). In reference to age, the incidents in Al-Ahsaa were mainly limited to the ages 28-33 years old. However, the majority of incidents (60%) in the northern area were among 13-40 years old patients (Fallatah et al., 2005). Whereas in Tabuk the median age was 13.9 (Elbeltagy, 2001). The national health report of year 2006 indicated that the incidents of brucellosis was higher among 15-44 years old patients (Ministry of Health Annual Report, 2006).

In conclusion, the study has confirmed the continuous risk of brucellosis in Al-Ahsaa area. The current results emphasize the importance of optimizing the vaccination program and the public awareness activities that assist in complete eradication of the disease.

Acknowledgment

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References:


الحمى الملطية (البروسيلا) في الإنسان في محافظة الأحساء

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الملخص:

الحمى الملطية (البروسيلا) من الأمراض المنتقلة من الحيوان إلى الإنسان واسعة

الانتشار في العالم. تعتبر البروسيلا من الأمراض المستوطنة في أغلب مناطق المملكة. تناولت الدراسة حالات البروسيلا في الخمس سنوات الماضية (2004-2010) في محافظة الأحساء. استهدفت الدراسة معرفة مدى الإصابات بين البشر في المحافظة، واستطاعت تأثير البرنامج الإجباري لتعليم القطنان الذي تفرضه وزارة الزراعة على عدد الإصابات. تم الحصول على أعداد مرضى المصاصين بالبروسيلا من سجلات قسم الطبي الوقائي لقيادة الصحة بالأحساء. وقد تم تصنيف المعلومات على أساس العمر، الجنس، الجنسية والأماكن المختلفة في الأحساء. لقد أظهر التحليل الإحصائي (الوسطي المستديمي باستخدام التبليين العقاري عن 5%) انخفاضًا واضحًا (P<0.001) في عدد المصابين في عام 2010. كما أظهر التحليل الإحصائي زيادة عالية في الإصابة بين الرجال دون النساء (P<0.05). كما أن عدد الإصابات البشرية في قضاء من السلامة والوقاية، منطقة الأحساء، أعلى من أي جزء آخر من الأحساء.

الدراسة وقفت لأول مرة الإصابة البشرية بالبروسيلا في الأحساء وأصدرت على استمرار هذه الإصابات و إن مكان عدد أداة تناقل في السنوات الأخيرة من الدراسة. أن تناول عدد الإصابات قد يؤكد على فاعلية برنامج التدريب الإجباري للبروسيلا لتعليم الحيوانات التي تطيله وزارة الزراعة. نتائج هذه الدراسة تؤكيد الاستقلال القصوى من هذا البرنامج من خلال التشديد على تطبيقه وتوسيع المستفيدين منه.

الكلمات النتيجة:

الحمى الملطية في الإنسان، الأحساء، التعليم، المملكة العربية السعودية.