

## Awareness of Jouf University Medical Students about Brucellosis

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### ABSTRACT

**Background:** Brucellosis can be well-defined as a bacterial zoonotic infection conveyed to humans by direct interaction with infected animals or its food products such as meat, cheese, and unpasteurized milk mainly domesticated ruminants and swine.

**Objective:** Determination of the students' knowledge about Brucellosis.

**Methods:** Medical students of Jouf University asked to complete a questionnaire capture about their knowledge on the etiology, clinical feature, complications, prognosis and prevention of brucellosis.

**Results:** The overall results showed that there is a lack in awareness about brucellosis among the students.

**Conclusion:** The medical training institutions should give special consideration to brucellosis in their teaching curricula.

**Keywords:** Awareness, Brucellosis, Medical Practitioners.

### INTRODUCTION

Brucellosis can be defined as a bacterial zoonotic infection transmitted to humans by direct contact with infected animals or its food products such as unpasteurized milk, meat and cheese, predominantly domesticated ruminants and swine<sup>(1)</sup>. The disease is caused by *Brucellae* which are aerobic intracellular Gram-negative coccobacilli and have the ability to survive and multiply inside mononuclear phagocytes<sup>(2)</sup>.

Furthermore, Brucellosis can be presented as acute or chronic infection characterized by fever, night sweats, myalgias, fatigue, headache, weight loss and anorexia<sup>(3)</sup>. Different studies showed that the incidence of abortion and IUFD in pregnant women infected with *brucellosis* are higher than uninfected pregnant women<sup>(4)</sup>. Other complications could happen such as spondylitis, neurobrucellosis and endocarditis<sup>(3)</sup>.

Indeed, Sufficient knowledges are required to improve patients health conditions to assure delivering the necessary and proper health care<sup>(5)</sup>. Lack of knowledge found to be correlated with poor management of cases<sup>(6)</sup>. In the other hand, educational interventions are effective strategy for better diagnosis of diseases<sup>(7)</sup>.

#### Objective

The aim of the study was to measure the level of awareness among the practitioners. It is considered as an important issue toward improving the management and dealing with of Brucellosis, especially in endemic area as in Saudi Arabia<sup>(8)</sup>.

### MATERIALS AND METHODS

The present study is a cross-sectional study. The target population was the medical students of Jouf University, Saudi Arabia. However, a total of 165

medical students were voluntarily and anonymously surveyed in the current study. A questionnaire was developed after surveying the literatures, the questionnaire was tested on a sample of students for reliability. Necessary correction was made in the questionnaire. The period of the study was from February 3, 2016 to April 8, 2016.

#### Statistical data analysis procedure:

The data were analyzed using SPSS Version-19 for frequencies in awareness about Brucellosis between groups of the medical students.

### RESULTS

A total of 165 Medical students of al-Jouf University were surveyed in this study, they included 26 (15.8%) 1<sup>st</sup> year students, 57 (34.5%) 2<sup>nd</sup> year students, 37 (22.4%) 3<sup>rd</sup> year students, 17 (10.3%) 4<sup>th</sup> year students and 28 (17%) 5<sup>th</sup> year students.

| Year  | Frequency | Percent |
|-------|-----------|---------|
| 1st   | 26        | 15.8    |
| 2nd   | 57        | 34.5    |
| 3rd   | 37        | 22.4    |
| 4th   | 17        | 10.3    |
| 5th   | 28        | 17.0    |
| Total | 165       | 100.0   |

Table 2 shows the awareness about the etiology of brucellosis. Out of all surveyed students 4<sup>th</sup> year students have the highest proportion of correct answers (68.24%) and 3<sup>rd</sup> year students have the lowest rate of proportion of correct answers (51.35%). It should be pointed out that there is a false belief in the community that camel products are not harmful. So, it was included in the questionnaire.

**Table 2: Knowledge on etiology of brucellosis**

| Questions on etiology                | Correct answers [N(%)] |              |             |             |             |              |
|--------------------------------------|------------------------|--------------|-------------|-------------|-------------|--------------|
|                                      | 1st year               | 2nd year     | 3rd year    | 4th year    | 5th year    | Total        |
| Causative organism (Bacteria)        | 17 (65.38%)            | 36 (63.16%)  | 29 (78.38%) | 17 (100%)   | 27 (96.43%) | 126 (76.36%) |
| Under cooked meat                    | 13 (50%)               | 16 (28.07%)  | 15 (40.54%) | 6 (35.29%)  | 11 (39.29%) | 61 (36.97%)  |
| Eating or drinking camel meat & milk | 12 (46.15%)            | 28 (49.12%)  | 23 (62.16%) | 13 (76.47%) | 18 (64.29%) | 94 (56.97%)  |
| Drinking unpasteurized Milk          | 16 (61.54%)            | 36 (63.16%)  | 17 (45.95%) | 12 (70.59%) | 21 (75%)    | 102 (61.82%) |
| Direct Contact with infected animal  | 16 (61.54%)            | 32 (56.14%)  | 11 (29.73%) | 10 (58.82%) | 11 (39.29%) | 80 (48.48%)  |
| Average                              | 74 (56.92%)            | 148 (51.93%) | 95 (51.35%) | 58 (68.24%) | 88 (62.86%) | 463 (56.12%) |

In awareness about clinical features of brucellosis, the range of proportion of correct answers was between 56.02% - 66.84%. The highest proportion of correct answers was found in 4<sup>th</sup> year students (66.84%) while, the lowest was in 3<sup>rd</sup> year students (56.02%), (Table 3).

**Table 3: Knowledge on clinical features of brucellosis**

| Questions on clinical features | Correct answers [N(%)] |              |              |              |              |              |
|--------------------------------|------------------------|--------------|--------------|--------------|--------------|--------------|
|                                | 1st year               | 2nd year     | 3rd year     | 4th year     | 5th year     | Total        |
| Fever                          | 24 (92.31%)            | 47 (82.46%)  | 34 (91.89%)  | 17 (100%)    | 26 (92.86%)  | 148 (89.7%)  |
| Chill                          | 4 (15.38%)             | 29 (50.88%)  | 19 (51.35%)  | 15 (88.24%)  | 19 (67.86%)  | 86 (52.12%)  |
| Muscular pain                  | 16 (61.54%)            | 38 (66.67%)  | 18 (48.65%)  | 13 (76.47%)  | 17 (60.71%)  | 102 (61.82%) |
| Hypothermia                    | 26 (100%)              | 49 (85.96%)  | 32 (86.49%)  | 16 (94.12%)  | 25 (89.29%)  | 148 (89.7%)  |
| Rush                           | 19 (73.08%)            | 26 (45.61%)  | 26 (70.27%)  | 14 (82.35%)  | 25 (89.29%)  | 110 (66.67%) |
| Night Sweating                 | 10 (38.46%)            | 21 (36.84%)  | 4 (10.81%)   | 2 (11.76%)   | 10 (35.71%)  | 47 (28.48%)  |
| Headache                       | 15 (57.69%)            | 34 (59.65%)  | 18 (48.65%)  | 8 (47.06%)   | 13 (46.43%)  | 88 (53.33%)  |
| Lose appetite                  | 15 (57.69%)            | 27 (47.37%)  | 13 (35.14%)  | 3 (17.65%)   | 11 (39.29%)  | 69 (41.82%)  |
| Weight loss                    | 6 (23.08%)             | 18 (31.58%)  | 6 (16.22%)   | 6 (35.29%)   | 7 (25%)      | 43 (26.06%)  |
| Hyperglycemia                  | 22 (84.62%)            | 54 (94.74%)  | 36 (97.3%)   | 17 (100%)    | 28 (100%)    | 157 (95.15%) |
| Fatigue                        | 18 (69.23%)            | 40 (70.18%)  | 22 (59.46%)  | 14 (82.35%)  | 16 (57.14%)  | 110 (66.67%) |
| Average                        | 175 (61.19%)           | 383 (61.08%) | 228 (56.02%) | 125 (66.84%) | 197 (63.96%) | 108 (61.05%) |

Regarding the awareness about the complications due to the lack of the knowledge about brucellosis, the highest proportion of correct answers was found in the 3<sup>rd</sup> year students (49.25%) while, the lowest was in 1<sup>st</sup> year students (38.04%), (Table 4).

**Table 4: Knowledge on complications of brucellosis**

| Questions on complications | Correct answers [N(%)] |              |              |             |              |              |
|----------------------------|------------------------|--------------|--------------|-------------|--------------|--------------|
|                            | 1st year               | 2nd year     | 3rd year     | 4th year    | 5th year     | Total        |
| Anemia                     | 10 (38.46%)            | 38 (66.67%)  | 22 (59.46%)  | 7 (41.18%)  | 15 (53.57%)  | 92 (55.76%)  |
| Hepatic Failure            | 4 (15.38%)             | 22 (38.6%)   | 19 (51.35%)  | 7 (41.18%)  | 11 (39.29%)  | 63 (38.18%)  |
| Renal Failure              | 14 (53.85%)            | 44 (77.19%)  | 33 (89.19%)  | 13 (76.47%) | 16 (57.14%)  | 120 (72.73%) |
| CNS Infection              | 10 (38.46%)            | 24 (42.11%)  | 10 (27.03%)  | 13 (76.47%) | 10 (35.71%)  | 67 (40.61%)  |
| Endocarditis               | 1 (3.85%)              | 5 (8.77%)    | 11 (29.73%)  | 8 (47.06%)  | 12 (42.86%)  | 37 (22.42%)  |
| Liver Abscess              | 5 (19.23%)             | 26 (45.61%)  | 11 (29.73%)  | 1 (5.88%)   | 9 (32.14%)   | 52 (31.52%)  |
| Abortion                   | 15 (57.69%)            | 27 (47.37%)  | 29 (78.38%)  | 9 (52.94%)  | 17 (60.71%)  | 97 (58.79%)  |
| IUFD                       | 13 (50%)               | 26 (45.61%)  | 19 (51.36%)  | 8 (47.06%)  | 17 (60.71%)  | 83 (50.3%)   |
| Preterm Birth              | 10 (38.46%)            | 9 (15.79%)   | 10 (27.03%)  | 9 (52.94%)  | 7 (25%)      | 45 (27.27%)  |
| Average                    | 82 (38.04%)            | 221 (43.08%) | 164 (49.25%) | 75 (49.02%) | 114 (45.24%) | 656 (44.18%) |

Awareness about the prognosis of brucellosis was 85.71% of the 5<sup>th</sup> year students which was the highest and the lowest was in 3<sup>rd</sup> year students (45.95%). (Table 5)

**Table 5: Knowledge on prognosis of brucellosis**

|      | Correct answer [N(%)] |              |
|------|-----------------------|--------------|
| Year | 1st                   | 16 (61.54%)  |
|      | 2nd                   | 41 (71.93%)  |
|      | 3rd                   | 17 (45.95%)  |
|      | 4th                   | 13 (76.47%)  |
|      | 5th                   | 24 (85.71%)  |
|      | Average               | 111 (67.27%) |

Awareness about the prevention of brucellosis found to be highest in 4<sup>th</sup> year students with 73.11% of correct answers while, the lowest was in 5<sup>th</sup> year students with 57.65% of the correct answers. (Table 6)

**Table 6: Knowledge on prevention of brucellosis**

| Questions on prevention              | Correct answers [N(%)] |                |                 |                |                 |                 |
|--------------------------------------|------------------------|----------------|-----------------|----------------|-----------------|-----------------|
|                                      | 1st year               | 2nd year       | 3rd year        | 4th year       | 5th year        | Total           |
| Regular Testing of Animals           | 12<br>(46.15%)         | 31<br>(54.39%) | 18<br>(48.65%)  | 11<br>(64.71%) | 15<br>(53.57%)  | 87<br>(52.73%)  |
| Killing Infected Animals             | 10<br>(38.46%)         | 16<br>(28.07%) | 15<br>(40.54%)  | 6<br>(35.29%)  | 3 (10.71%)      | 50 (30.3%)      |
| Immunization of Animals              | 13 (50%)               | 37<br>(64.91%) | 16<br>(43.24%)  | 11<br>(64.71%) | 8 (28.57%)      | 85<br>(51.52%)  |
| Stop eating meat                     | 21<br>(80.77%)         | 46<br>(80.7%)  | 29<br>(78.38%)  | 16<br>(94.12%) | 24<br>(85.71%)  | 136<br>(82.42%) |
| Stop drinking milk                   | 16<br>(61.54%)         | 44<br>(77.19%) | 27<br>(72.97%)  | 15<br>(88.24%) | 24<br>(85.71%)  | 126<br>(76.36%) |
| Stop Direct Contact with all animals | 17<br>(65.38%)         | 34<br>(59.65%) | 27<br>(72.97%)  | 13<br>(76.47%) | 20<br>(71.43%)  | 111<br>(67.27%) |
| Pasteurization milk                  | 17<br>(65.38%)         | 31<br>(54.39%) | 18<br>(48.65%)  | 15<br>(88.24%) | 19<br>(67.86%)  | 100<br>(60.61%) |
| Average                              | 106<br>(58.24%)        | 239<br>(59.9%) | 150<br>(57.92%) | 87<br>(73.11%) | 113<br>(57.65%) | 695<br>(60.17%) |

## DISCUSSION

Diagnosis and diseases reporting depend largely on the level of awareness of the diseases. Knowledge of reservoirs of zoonotic diseases and the mechanism of their transmission to humans has enabled not only their diagnosis and reporting but also their control<sup>(9)</sup>. Our current study has emphasized on the importance of raising the awareness of Brucellosis disease and the possible control and/or prevention the spread of that disease.

Knowledge of animal reservoir and transmission modes has enabled the identification and control of zoonosis outbreaks in the world such as Rift Valley fever in Kenya and Somalia<sup>(10)</sup>. It has however been noted in some countries that zoonosis are causing prolonged and unnotified human suffering<sup>(11)</sup>. In countries where malaria is endemic such as Saudi Arabia, diseases such as brucellosis have been under-diagnosed because of their similarities in clinical exhibitions<sup>(12)</sup>. It is therefore important to optimize

the diagnosis of other diseases such as brucellosis that have significant socio-economic impact on human life.

A study carried out by **John *et al.*** in Tanzania on medical practitioners (58%) gave correct answers about the clinical features of Brucellosis out of 31 participant<sup>(13)</sup>. In our study, we have found that (61.05%) gave correct answers about the clinical features of Brucellosis out of 165 participants.

Adequate knowledge of animal reservoirs and transmission routes enable practitioners to focus on key areas related to the disease and hence reach the definitive diagnosis easier and earlier enough for prompt management of the disease<sup>(14)</sup>.

The results of the study indicated that it is possible that some brucellosis cases may be missed by those entrusted with the duty to identify them. Many reasons could explain these findings. These include students concentrating on endemic diseases or diseases that have been common in their areas and

ignore others such as brucellosis that are increasingly becoming of public health importance and the possibility that teaching curricula in medical training institutions do not put due emphasis on brucellosis.

The study has shed some light on an area that has not been received better attention before as a possible contributing factor to under-reporting of diseases such as brucellosis. A larger study covering a wider area could provide more conclusive results.

## CONCLUSION

Knowledge of medical practitioners of zoonosis could be among the contributing factors to under-diagnosis and under-reporting of zoonosis in Saudi Arabia. There is a great need that teaching curricula should give deep emphasis on Brucellosis. This will provide practitioners with adequate knowledge on Brucellosis prevention and possible control and/or eliminate that disease in our community.

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