

## البحث الاول

Risk factors and Molecular genotyping of *Brucellamelitensis* strains recovered from humans and their owned cattle in Upper Egypt By

*Nour H. Abdel-Hamid 1, Hazem M. Ghobashy 1, Eman I. Beleta 1, Essam M. Elbauomy 1, Rania I. Ismail 1, Sultan F. Nagati 2, Safaa K. Hassan 3, WalidElmonir 4,\**

*1- Department of Brucellosis Research, Animal Health Research Institute, Agricultural Research Center, Giza, Egypt*

*2- Department of Bacteriology, Animal Health Research Institute, Agricultural Research Center, Fayoum, Egypt*

*3-Department of Public Health and Community Medicine, Faculty of Medicine, Fayoum University, Fayoum, Egypt*

*4- Department of Hygiene and Preventive Medicine (Zoonoses), Faculty of Veterinary Medicine, Kafrelsheikh University, Kafrelsheikh, Egypt*

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### ABSTRACT

Brucellosis is a zoonosis that has a devastating impact on the economy and public health, particularly in the Middle East, including Egypt. This study aimed to define risk factors associated with brucellosis in humans and in their cattle in Fayoum governorate - Upper Egypt. Also, molecular genotyping of recovered *Brucellaisolates* from human cases and their cattle to assess the potential cross-species transmission in the study region. Data were obtained via double matched case–control studies for brucellosis in humans (106 cases and 160 controls) and in their cattle (78 cattle cases and 105 cattle controls). The results of multivariate regression

قائم بعمل عميد الكلية  
أ.د.عاصم العيسوي

قائم بعمل رئيس القسم  
أ.د.م. وفاء يوسف

analysis revealed that predictors of human brucellosis were animal-related occupations (OR 2.1,  $P$  0.02), previous infection in other household members (OR 3.2,  $P$  0.007), eating home-made soft cheese (OR 2.3,  $P$  0.03), and exposure to cattle abortions (OR 6.9,  $P$  <0.001). For cattle, predictors of brucellosis were maturity  $\geq 2$  years of age (OR 2.9,  $P$  0.01),  $\geq 2$  animals reared by the same household (OR 3.7–6.9,  $P$   $\leq$  0.001), and recent abortion (OR 15.2,  $P$  0.01). Twelve *Brucella* isolates were recovered from eight human cases (7.5%, 8/106) and four cattle cases (6.2%, 4/ 65). All isolates were *B. melitensis* biovar 3. Analysis of the *IS711* gene sequence revealed complete homology (100%) between isolates. Six virulence genes were utilized for virotyping: *virB*(100%), *omp25* (100%), *amiC*(100%), *ure*(91.7%), *wbkA*(91.7%), and *byfA*(75%). Virotyping revealed four virotypes: V1 (lack *byfA*, 16.7%), V2 (harbored all genes, 66.7%), V3 (lack *wbkA*, 8.3%), and V4 (lack *wbkA* and *ure*, 8.3%). Repetitive extragenic palindromic PCR (REP-PCR) typing revealed two REP types. Combined REP-PCR/virulence genotyping revealed five different genotypes (G1–G5) for the detected isolates and a unique genotype for the reference strain (G6, *B. melitensis* bv3 Ether). Human and cattle isolates from the same household had matched genotypes. In conclusion, there were widespread risk factors among the cases studied. Health education for high-risk groups is essential for disease prevention, and combined REP-PCR/virulence genotyping is a quick tool for traceability, particularly in developing countries endemic with brucellosis as Egypt.