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Phenotypic and genotypic antibiotic resistance features of *Staphylococcus aureus* Isolated from raw milk and traditional cheese

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The objectives of this study were to determine the antibiotic resistance enterotoxigenic *S. aureus* within 205 raw milk and traditional cheese samples examined. The isolated *S. aureus* showed resistance, mainly to oxacillin 71 (67.6%, 71/105), penicillin 67 (63.8%, 67/105), erythromycin 47 (44.8%, 47/105), vancomycin 41 (39.1%, 41/105), respectively. The multidrug-resistant *S. aureus* were detected in 54 (51.4%) *S. aureus* isolates. The isolated *S. aureus* were screened for the presence of *mecA, vanA, and ermC* genes; 78 (74.3%, 78/105), 50 (47.6%, 50/105), and 38 (36.2%, 38/105) of the isolated *S. aureus* strains carried the carried the *mecA, ermC, vanA* genes respectively. High level of MRSA contamination 52 (49.5%, 52/105) were detected and it was in details as follows; 31 (77.5%, 31/40), 5 (50%, 5/10), 10 (50%, 10/20), 5 (20%, 5/25), and 1(10%, 1/10) within the examined cattle milk, sheep milk, white cheeses, other cheese, and cheddar cheese samples, respectively. 33 (31.4%, 33/105) of the examined *S. aureus* strains were both phenotypic vancomycin resistant and genotypic *vanA* gene carrier representing VRSA strains while, 44 (42%, 44/105) of the *S. aureus* strains were phenotypic erythromycin resistant and genotypic ermC gene carrier. In conclusion, it is evident that, the detection of high level of MRSA contamination 52 (49.5%, 52/105) in milk and cheese samples examined is regarded as a potential public health hazard facing their consumers. It is better to correct the unhygienic behavior during milk production and cheese manufacturing. Regular examination of the milk and traditional cheese for the presence of MRSA is required to provide an indication for the public health hazards associated with their consumption.

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Molecular mechanisms and neuronal pathways implicated in rapid-acting anti-depressive ketamine properties

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Statement of the Problem: The emergence of rapid-acting antidepressants such as ketamine has motivated studies aiming to reveal the molecular mechanism of the ketamine antidepressant effect and to enable the clinical application of rapid-acting antidepressants. Furthermore, potential role of Integrin Beta-3 (ITGB3) and close homologue of L1 (CHL1), in the mode of action of antidepressants was postulated. There is substantial number of ongoing studies addressing the antidepressant effects of ketamine in depressed patients and animal models of depression. Reduction of depressive symptoms in humans could be compared with the reduction in immobility time in the forced swim test in rodents after acute ketamine treatment.

Methodology & Theoretical Orientation: Using corticosterone-induced chronic stress and depression model we have previously demonstrated reduction of expression of ITGB3 in prefrontal cortex (PFC) of stressed/depressed animals, and protective role of 14-day long oxytocin treatment on DNA oxidative damage and expression of ITGB3 in this model. In the ongoing study we are exploring effects of acute ketamine treatment on behavioral and molecular markers of depression and oxidative stress. Also, IHC analysis is applied in order to examine potential biochemical pathways involved in the rapid antidepressant response to ketamine, and weather the activation of the ventral hippocampus-medial prefrontal cortex-dorsal raphae nuclei (vHC-mPFC-DRN) neuronal pathway may mediate the antidepressant effect of ketamine.

Conclusion & Significance: Hopefully, our current results will contribute to the progress in ketamine research and to more precisely identify molecular markers and neuronal pathways involved in ketamine's mode of action. Further longitudinal clinical trials are necessary to identify patients that would be good candidates and responders to the ketamine treatment or successful application of novel rapid-acting antidepressants in the future.

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