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Assessment of Sex Differences in Serum Urea and Creatinine Level in Response to Spinal Cord Injury Using Albino Rat Models

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Abstract : Background: One of the most serious consequences of spinal cord injury (SCI) is progressive deterioration of renal function mostly as a result of urine stasis and ascending infection of the paralyzed bladder. This necessitates for investigation of early changes in serum urea and creatinine and associated sex related differences in response to SCI. Methods: A total of 24 adult albino rats weighing above 150g were divided equally into two groups, a control and experimental group (n = 12) each containing an equal number of male and female rats. The experimental group animals were paralyzed by complete transection of spinal cord below T4 level after deep anesthesia with ketamine 75mg/kg. Blood samples were collected from both groups five days post SCI for analysis. Mean values of serum urea (mmol/L) and creatinine (µmol/L) for both groups were compared. $P < 0.05$ was considered as significant. Results: The results showed significantly higher levels ($P < 0.05$) of serum urea and creatinine in the male SCI models with mean values of 92.12 ± 0.98 and 2573 ± 70.97 respectively compared with their controls where the mean values for serum urea and creatinine were 6.31 ± 1.48 and 476. 95 ± 4.67 respectively. In the female SCI models, serum urea 13.11 ± 0.81 and creatinine 519.88 ± 31.13 were not significantly different from that of female controls with serum urea and creatinine levels of 11.71 ± 1.43 and 493.69 ± 17.10 respectively ($P > 0.05$). Conclusion: Spinal cord injury caused a significant increase in serum Urea and Creatinine levels in the male models compared to the females. This indicated that males might have higher risk of renal dysfunction following SCI.

Keywords : albino rats, creatinine, spinal cord injury (SCI), urea
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