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The Balancing of the Parental Responsibilities and Right and the Best Interest of the Child within the Parent-Child Relationship

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Abstract : Amniotic fluid stem cells (AFSC) have been shown to contribute towards the amelioration of Acute Renal Failure (ARF), but the mechanisms underlying the renoprotective effect are largely unknown. Therefore, the main goal of the current study was to evaluate the therapeutic efficacy of AFSC in a cisplatin-induced rat model of ARF and to investigate the underlying mechanisms responsible for its renoprotective effect. To study the therapeutic efficacy of AFSC, ARF was induced in Wistar rats by an intra-peritoneal injection of cisplatin, and five days after administration, the rats were randomized into two groups and injected with either AFSC or normal saline intravenously. On day 8 and 12 after cisplatin injection, i.e., day 3 and day7 post-therapy respectively, the blood biochemical parameters, histopathological changes, apoptosis, and expression of pro-apoptotic, anti-apoptotic and autophagy-related proteins in renal tissues were studied in both groups of rats. Administration of AFSC in ARF rats resulted in improvement of renal function and attenuation of renal damage as reflected by significant decrease in blood urea nitrogen, serum creatinine levels, tubular cell apoptosis as assessed by Bax/Bcl2 ratio, and expression of the pro-apoptotic proteins viz. PUMA, Bax, cleaved caspase-3 and cleaved caspase-9 as compared to saline-treated group. Furthermore, in the AFSC-treated group as compared to saline-treated group, there was a significant increase in the activation of autophagy as evident by increased expression of LC3-II, ATG5, ATG7, Beclin1 and phospho-AMPK levels with a concomitant decrease in phospho-p70S6K and p62 expression levels. To further confirm whether the protective effects of AFSC on cisplatin-induced apoptosis were dependent on autophagy, chloroquine, an autophagy inhibitor was administered by the intra-peritoneal route. Chloroquine administration led to significant reduction in the anti-apoptotic effects of the AFSC therapy and further deterioration in the renal structure and function caused by cisplatin. Collectively, our results put forth that AFSC ameliorates cisplatin-induced ARF through induction of autophagy and inhibition of apoptosis. Furthermore, the protective effects of AFSC were blunted by chloroquine, highlighting that activation of autophagy is an important mechanism of action for the protective role of AFSC in cisplatin-induced renal injury.

Keywords : best interest of the child, children's rights, parent and child relationship, parental responsibilities and rights
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