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Clinical relevance Th1/Th2 /Th17 and Treg cells in post traumatic sepsis and shock

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Introduction: Severe trauma complicated with multiple organ dysfunction syndromes (MODS) is among the leading causes of deaths. Alarmingly, the mortality rate, owing to multiple causes e.g., with or without sepsis is now reported to cross the value of 50%.

Objective: The aim of this study is to examine the cause of imbalance in cytokine profile, immune-paralysis (T cell anergy) in trauma hemorrhagic shock (THS) and septic shock patients.

Methodology: We have measured the T-cell proliferation assay using dominant antigens of both Gram positive (LTA, 100 ng/ ml) and Gram negative (LPS-100 ng/ml) bacteria and PHA (4 μ g/ml) using radioactive thymidine (1H³) assay. At the same time measured the culture supernatant for cytokine levels using Cytokine bead assay (CBA).

Results & Conclusion: In the hemorrhagic shock patients, we observed significant (P<0.05) fall T-cell proliferation in comparison to healthy control. Our study also showed patients died due to sepsis/septic shock had low T-cell function and had significantly elevated levels of IL-4, IL-10 and TGF- β but very low level of IL-2 and IFN- γ in culture supernatant. THS patients who developed sepsis complication had significantly high T-regulatory cells and low Th17 cells. In conclusion, our study showed imbalance in cell mediated immune response and disturbance in Th1/Th2/Th17 and Treg population of T-helper cells and also the shifts towards Th2 and Treg in patients who had developed sepsis and showed poor outcomes.

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A dual-targeting drug co-delivery system for tumor chemo and gene combined therapy

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egulation of gene expression using p53 is a promising strategy for treatment of numerous cancers and chemotherapeutic Kdrug dichloroacetate (DCA) induces apoptosis and growth inhibition in tumor without apparent toxicity in normal tissues. Combining DCA and p53 gene could be an effective way to treat tumors. The progress towards broad applications of DCA/ p53 combination requires the development of safe and efficient vectors that target to specific cells. In this study, we developed a DSPE-PEG-AA(1,2-distearoryl-sn-glycero-3-phosphoethanolamine-N-[methoxy(polyethyleneglycol-2000)] ammonium saltanisamide) modified reconstituted high-density lipoprotein-based DCA/p53-loaded nanoparticles (DSPE-PEG-AA/rHDL/ DCA-PEI/p53 complexes), which was fabricated as a drug/gene dual-targeting co-delivery system for potential cancer therapy. Here, DCA-PEI was utilized to effectively condense the p53 plasmid to incorporate the plasmid into rHDL and to act as an antitumor drug to inhibit tumor cell growth. The DSPE-PEG-AA/rHDL/DCA-PEI/p53 complexes exhibited desirable and homogenous particle size, neutral surface charge and low cytotoxicity for normal cells in vitro. The results of confocal laser scanning microscopy (CLSM) and flow cytometry confirmed that the scavenger receptor class B type-I (SR-BI) and sigma receptor mediated dual-targeting function of the complexes inducing efficient cytoplasmic drug delivery and gene transfection in human lung adenocarcinoma cell line A549. And in vivo investigation on nude mice bearing A549 tumor xenografts revealed that DSPE-PEG-AA/rHDL/DCA-PEI/p53 complexes possessed specific tumor targeting and strong antitumor activity. The work described here demonstrated that the DSPE-PEG-AA/rHDL/DCA-PEI/p53 complexes might offer a promising tool for effective cancer therapy.

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