

Cool clot, a novel haemostatic agent for controlling life-threatening arterial bleeding

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Uncontrolled bleeding is the first leading cause of preventable death in the battlefield and the 2nd cause of mortality in civil accidents. Incompressible hemorrhage control is among the interventions that drastically increase the survival rate in wounded individuals. We have previously shown that a certain mixture of bentonite and zeolite minerals can significantly decrease the bleeding in rats. In this study, five healthy hybrid dogs were selected and after induction of anesthesia with ether, either arterial puncture by a needle or arteriotomy was performed on both groin regions of the dogs. For control arteries (either right or left femoral artery), only pressure by sterilized gauze was performed, while for the femoral arteries of the opposite side, our invented haemostatic agent, namely CoolClot, was topically used before applying the pressure. In the second stage of the study, to assess the coagulation time, blood samples were collected from 10 volunteer students. CoolClot significantly decreased the bleeding time in animals whose femoral arteries were cut or punctured. In the human phase of the study, the mean coagulation time in control blood samples was 253.4 ± 44.1 sec, while for blood samples treated with bentonite, zeolite and CoolClot it was 149.5 ± 50.0 , 162.3 ± 74.6 and 143.4 ± 114.6 sec, respectively ($p < 0.05$). As controlling bleeding after a life-threatening arterial damage is critical for increasing the chance of survival, the results obtained in this study indicate the significant efficacy of CoolClot in shortening the bleeding time. Our experiments also indicate that CoolClot can significantly reduce the clotting time in human blood samples.

Biography

SMJ Mortazavi holds the position of Professor of Medical Physics in the School of Medicine of Shiraz University of Medical Sciences (SUMS). He currently serves as the chairman of the Center for Research on Radiation Sciences (CRRS). He is also the vice dean for research at school of Allied Medical Sciences, Shiraz University of Medical Sciences. Mortazavi has authored about 70 papers in peer reviewed journals in the area of radiation protection, dosimetry, natural radiation, radiation hormesis, radioadaptive response and the possible role of radioadaptive response in radiation protection. He has also published papers on the future role of radioadaptation in long term stay of humans in space.

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