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Medicine in Space and Extreme Environments (4)

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MARS MEDICS ANALOG ASTRONAUT MISSION DURING AUSTERE I.C.E (ISOLATED AND
CONFINEMENT ENVIRONMENT) – NEPAL SCENARIO**Abstract**

INTRODUCTION: Simulation missions targeted for other planetary bodies are conducted to understand and prepare for contingencies. Few analog missions have been conducted in high altitude regions. This Mars Analog mission by Mars Academy USA (MAU) was conducted as part of their mid fidelity trials in austere environment under Project NEAME (Nepal, Everest, Africa, Americas, Arctic, Antarctica Mars Medics Expeditions).

MATERIALS METHODS:An international crew of six was selected after extensive physical and mental status review. Crew composition included a mixture of backgrounds with 3 men and 3 women from ages 30 to 60. The crew was supported by on-site professionals and remote medical and support teams. Majority of the crew had already been participants in prior simulation missions.

MARS SIMULATION:The test site was located at an altitude of 10000 ft in the Lower Mustang area of Nepal. Geographical scouting was performed and after careful consideration, an area resembling Mars was selected. A portable interconnected “Mars” basecamp acted as the primary mission site and was erected for habitation with a second crew support base-camp deployed a few miles away. Pre-simulation and crew co-ordination activities were performed a week prior to the simulation. Isolation and confinement were simulated. Communication, extra vehicular activity, medical protocols were in place prior. A daily flight plan was provided by the flight director and mission support. Astro-wellness, crew health, physical and physiological parameters were assessed. Simulated medical emergencies, evacuation and treatment of casualties in a space clinic were performed to assess the existing protocols.

DESCRIPTION: Isolation and confinement in a high-altitude environment simulate some of the harsh environmental factors on the Martian surface. The austere environment helps to understand close quarter human dynamics; individual and crew experiences of challenging scenarios and planned team efforts. Several psychological panels were administered to study the human factors along with measurement of physiological parameters.

CONCLUSION: Considering the rarity of planned simulation missions at high altitude, the collected data would provide considerable insight into some aspects of life on Mars. Further to this, the simulation also provided essential experience to crew members of an isolated, confined and extreme environment (ICE), in preparation towards planned high fidelity missions by Mars Academy USA in the future.