Contribution ID: **957** Type: **Talk in simposio**

COGNITIVE AND PHYSICAL FATIGUE INDUCED BY MILITARY OPERATIONS IN ISOLATED AND COLD ENVIRONMENT (ICE)

Saturday, September 13, 2025 4:10 PM (20 minutes)

Purpose.The Arctic environment is characterized by extreme stressors which can impair soldiers' cognitive and physical performance, particularly during military operations. This study sought to examine the effects of operating in ICE on cognitive and physical fatigue in alpine soldiers.

Methods.36 Alpine Corps soldiers underwent testing before, during, and after a three-days simulated military operation on Mont Blanc(3375m). Additional testing occurred at 551m, four days before and fourteen days after the operation. Soldiers were divided into three groups based on their mountain warfare experience and operational role. Daily testing occurred before and after the military operation, which included trekking and survival tasks. Pre-operation measures included Groningen Sleep Quality and Fatigue scales, a 5-min psychomotor vigilance task (PVT), and a 5-min step test. Post-operation measures repeated the PVT and step test. They also rated perceived exertion (sessionRPE) and workload (NASA-TLX) during the operation, and the subjective change in fatigue (Fatigability scale). Mixed Models tested effects of Group, Day, and Time($p<0.05$).

Results.Cognitive performance deteriorated significantly after operating on the first day in ICE($p<0.05$), indicating acute cognitive fatigability. Military training was perceived as more mentally and physically demanding in ICE as fatigue, fatigability, NASA-TLX variables and sRPE significantly deteriorated($p<0.05$).

Conclusions.Even specialized alpine soldiers experienced notable cognitive and physical impairments in ICE. The interaction between military operation and ICE significantly decreased cognitive performance, particularly on the first day. These findings highlight the need for countermeasures to mitigate the effects of ICE on soldiers' cognitive and physical fatigue, particularly during the initial phase of the exposure.

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The Psychology of Space Exploration and Extreme Environments

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No

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