Tactical Gear does not Affect the Sensory Organization Test of Special Warfare Combatant-craft Crewman

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ABSTRACT

Naval Special Warfare’s Special Warfare Combatant-craft Crewman (SWCC) function primarily on small, high speed boats on ocean and small river water systems. Gear carried for protection and tactical operation may impact balance by moving the center of mass, altering sensory input, hindering response time, influencing musculoskeletal injury. Research on how tactical gear affects the performance of sensory systems (somatosensory, visual, and vestibular) responsible for balance is limited. Dynamic posturography systems assess function and coordination of these systems with the Sensory Organization Test (SOT). PURPOSE: The purpose of this study was to determine if body armor and tactical gear affects postural stability in SWCC Operators. The purpose of this study was to determine if tactical gear affects the performance of sensory systems (somatosensory, visual, and vestibular) responsible for balance. METHODS: Eight SWCC Operators cleared for full active duty participated in the study (27.1 ± 6.5 yr, 190.7 ± 5.7 kg). All subjects performed a total of 12 postural stability tests that included apparel, blue weapons, magazines, helmet and night optic devices (mean mass = 21.7 ± 6.5 cm, 90.7 ± 5.7 g). Each subject completed three trials of six conditions (C1-C6) that included five static conditions (C1-C5) and one dynamic condition (C6) (Table 1). The NeuroCom Balance Manager Smart Equitest (Clackamas, OR, USA) was utilized to determine sensory control during stable and unstable support along with static and dynamic visual environments. The SOT consists of six conditions (C1-C6) (Table 1) that were not normally distributed therefore Wilcoxon Signed Rank tests were used to compare each subject’s performance on each postural stability variable between TG and NTG conditions, indicating the basic function of sensory systems is not changed in static conditions. Further evaluation under more challenging and dynamic conditions is appropriate.

SUBJECTS

Subjects were recruited as part of a Task and Demand Analysis to determine risk for musculoskeletal injury (Table 1). SWCC Operators demonstrated no effects of wearing tactical gear during the SOT, although no changes were observed during the SOT. Postural stability is imperative to completing any task while carrying a load and this consistent exposure to an unstable working platform may explain the lack of change between tactical gear conditions.

EXPERIMENTAL DESIGN AND METHODS

PROCEDURES

SWCC Operators work and train on small water craft and this consistent exposure to an unstable working platform may explain the lack of change between tactical gear conditions. Performing further evaluation under more challenging and dynamic conditions is appropriate. The SOT consists of six conditions (C1-C6) (Table 1) that were not normally distributed therefore Wilcoxon Signed Rank tests were used to compare each subject’s performance on each postural stability variable between TG and NTG conditions, indicating the basic function of sensory systems is not changed in static conditions. Further evaluation under more challenging and dynamic conditions is appropriate.

RESULTS

There were no statistically significant differences found between tactical gear conditions (p > 0.05). The means, standard deviations, median values, and interquartile ranges for each SOT variable (SOTcomp, SOM, VIS, VEST, PREF, C1, C2, C3, C4, C5, C6) are included (Table 2). Wearing tactical gear (TG) and without tactical gear (NTG) in a randomized order. Subjects were standard operational gear for TG tests that included apparel, blue weapons, magazines, helmet and night optic devices (mean mass = 21.7 ± 6.5 cm, 90.7 ± 5.7 g). All subjects performed a total of 12 postural stability tests that included apparel, blue weapons, magazines, helmet and night optic devices (mean mass = 21.7 ± 6.5 cm, 90.7 ± 5.7 g). Each subject completed three trials of six conditions (C1-C6) (Table 1) that included five static conditions (C1-C5) and one dynamic condition (C6) (Table 1) that were not normally distributed therefore Wilcoxon Signed Rank tests were used to compare each subject’s performance on each postural stability variable between TG and NTG conditions.

SUMMARY AND CONCLUSIONS

SWCC Operators demonstrated no effects of wearing tactical gear during the SOT, indicating the basic function of sensory systems is not changed in static conditions. SWCC Operators work and train on small water craft and this consistent exposure to an unstable working platform may explain the lack of change between tactical gear conditions. Postural stability is imperative to completing any task while carrying a load although no changes were observed during the SOT. Further evaluation under more challenging and dynamic conditions is appropriate.