Mental Practice enhances Technical Skills and Teamwork in Crisis Simulations - A Double-blind, Randomised Controlled Study

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Introduction

Opportunities for experiential learning of technical and non-technical skills required for safe surgery are decreasing. Mental Practice (MP), ‘the cognitive rehearsal of a task prior to performance,’ is successfully used in sport to enhance skill. This double-blind randomized-controlled study investigates if MP enhances performance in a laparoscopic crisis within a high-fidelity simulated OR.

Methods

Phase 1: A MP training protocol was developed (Cognitive-Task-Analysis) and validated with 20 surgeons and 20 safety experts. Phase 2: A further 32 Surgeons (16 Attendings, 16 Residents) were recruited. After baseline testing and familiarization, subjects were randomised to either MP (30 mins of MP) or control group (viewed online lecture). Subsequently, each subject performed a Laparoscopic Cholecystectomy with multiple crises built into the scenario (e.g., bleeding). Performance was assessed using the validated OSATS-based global-ratings scale (technical skill) and OTAS tool (Observational Teamwork Assessment for Surgery) by two trained and calibrated raters.

Results

Inter-rater reliability was high for technical skill (ICC=0.838) and teamwork (ICC=0.746). There were no inter-group differences in baseline ability. For Attendings and Residents, MP was superior to control in terms of technical skill (MP median 25.0 vs. Control median 21.5, p=0.001) and teamwork (MP median 28.0 vs Control median 21.5, p=0.001). Technical and team performance highly correlated (spearman rho = 0.765, p=0.008).

Conclusions

This is the first study to show that Mental Practice enhances both technical and team performance in a crisis simulation. MP is a time and cost-effective strategy to augment training in the OR, thus potentially improving patient care.