

ASRM Scientific Paper Presentations: Microsurgical Practice & Patient Safety

Monday, January 15, 2018, 1:30pm – 2:45pm

1:30 PM - 1:35 PM

RM 84. Proficiency and Stress of Medical Students Performing Novel Microsurgical Tasks

The Methodist Hospital Research Institute, Houston

Presenter: Dmitry Zavlin, MD

Dmitry Zavlin, MD(1), Ashik Khatri, PhD(2), Muhsin Z. Uğur, PhD(2), Ioannis T. Pavlidis, PhD(2), Jeffrey D. Friedman, MD(1), Shayan A. Izaddoost, MD, PhD(3) and Anthony Echo, MD(1)

(1)Houston Methodist Hospital, Weill Cornell Medicine, Houston, TX, (2)University of Houston, Houston, TX, (3)Baylor College of Medicine, Houston, TX

Background

Stress is a highly complex mechanism with endless implication on human beings. It plays a constant role in surgical specialties, in particular when performing microsurgical procedures. The Yerkes-Dodson 'law' from 1908 states that a person's performance increases with stress up to a point of sudden collapse. Negatively associated stress could therefore have a detrimental impact on the outcomes of microsurgery. In our study, we aimed to evaluate the proficiency and stress of unexperienced medical students performing standardized microsurgical tasks.

Methods

The student surgical societies of three medical schools were contacted for voluntary study participants. Exclusion criterion was experience in microsurgery. After a brief instruction presentation (week 0), the subjects performed two standardized microsurgical tasks, cutting and suturing, using 4.0x microsurgical loupes during a weekly session in our lab (weeks 1-5). Time was recorded and their skills evaluated by an independent reviewer following a global scale. In addition, the State-Trait Anxiety Inventory (STAI) and the NASA Task Load Index (NASA-TLX) were applied to assess both anxiety and workload.

Results

The 13 medical students (9 male, 4 female) had an average age of 23.3 ± 1.3 years and were either first years (9), second years (2), or third years (2). Ability to finish the cutting task within the 10min time limit was high with 12, 13, 13, 13, and 13 students for weeks 1-5, respectively. Their cutting speed increased using $6:25 \pm 2:12$ min to only $3:18 \pm 1:48$ min ($p < 0.001$) of the available time at the end of the study. 1, 4, 6, 9, and 11 students finished the suturing task within the allocated 20min during weeks 1-5, respectively ($p < 0.001$). Suturing speed increased from $19:57 \pm 0:12$ to $17:52 \pm 2:14$ ($p = 0.009$), as did the average number of successful stitches: 2.2 ± 1.5 to 5.7 ± 1.0 ($p < 0.001$). Surgical score for proficiency rose from 14.5 ± 3.1 to 22.3 ± 3.5 ($p < 0.001$). Anxiety before ($p = 0.248$) and after ($p = 0.125$) each weekly session remained stable. Subjective workload decreased consistently for both tasks throughout the study (suturing: $p = 0.002$; cutting: $p = 0.001$).

Conclusion

As microsurgical experience progresses, novice surgeons are able to both increase speed as well as proficiency in their work even without external guidance. They furthermore begin to perceive the workload as less of a burden. Continuous microsurgical training in the lab remains vital to condition young microsurgeons to the environment in the operating room.