ABSTRACT

Objective: The aim of the present study was to assess the influence of video game as warm-up before dry-lab laparoscopic activities.

Methods: Eleven medical students participated in this prospective randomized crossover study. Students were divided into two groups. Students in Group 1 had to execute an interrupted suture with the dominant hand using a standardized technique (non-video game group). Students in Group 2 performed the same suture, but after playing a video game match (video game group). After this initial task, groups were crossed. The time spent to complete each task was recorded, and the participants and observers had to judge the performance for each laparoscopic exercise. These variables were used as a measure of performance. Results: Mean time for laparoscopic surgery in this subset of inexperienced laparoscopic students was similar between non-video game versus video game groups (254.6 ± 187.7 versus 255.8 ± 183.6; p = 0.875). Subjective impression of observers regarding students’ performance was also similar (p = 0.662), but subjective impression of the participant about his own performance was different between both groups, with 64.7 versus 20.0% of participants that considered their performance good for video game versus non-video game groups (p = 0.044).

Conclusions: In conclusion, video games used as warm-up for laparoscopic practice seem to make inexperienced surgeons more confident and comfortable with the procedures, even though objective measures, as operative time and observers’ impression of surgeons’ performance do not seem to be affected by video game warm-up.

Keywords: Laparoscopic; Video games; Simulation; Education

RESUMO

Objetivo: Avaliar o efeito de um jogo de video game como aquecimento pré-operatório para a cirurgia laparoscópica.

Métodos: Foi realizado um estudo prospectivo cruzado com 11 estudantes de medicina e médicos residentes com pouca experiência em laparoscopia. Um grupo realizou suturas laparoscópicas em caixa preta sem aquecimento inicial, enquanto outro realizou aquecimento por meio de jogos de video game. Os grupos foram cruzados em um segundo momento. Resultados: O tempo médio para confeção de sutura laparoscópica foi semelhante entre os grupos Direto versus Video game (254.6 ± 187,7 versus 255,8 ± 183,6; p = 0.875). A impressão subjetiva dos avaliadores sobre o grau de dificuldade para a realização da tarefa também foi semelhante entre os grupos (p = 0.662). Em relação à percepção do cirurgião quanto ao grau de dificuldade para a realização do procedimento cirúrgico, observou-se que os cirurgiões do grupo Video game versus Direto tiveram uma percepção subjetiva de maior facilidade para a realização do exercício, sendo que a porcentagem de exercícios considerados de dificuldade baixa ou moderada foi de 64,7 versus 20,0% entre os grupos (p = 0.044). Conclusões: O emprego de jogo de video game como aquecimento para a cirurgia laparoscópica em cirurgiões pouco experientes parece torná-los mais receptivos para as dificuldades do procedimento, embora não altere o tempo para a realização dos procedimentos e nem a percepção alheia do grau de dificuldade.

Descritores: Laparoscopia; Jogos de video; Simulação; Educação
INTRODUCTION

Laparoscopic surgery brings new challenges to surgeons, as some difficulties are imposed by this surgical approach. Two-dimensional images, fixed trocars, limited articulation of instrument, fulcrum effect and impaired depth perception are some of the reasons for these difficulties. Similarly to soccer players that need warm-up exercises before playing a match, we have hypothesized that surgeons might have some benefit of preoperative warm-up exercises. Some studies have evaluated the association between video games and the acquisition of endoscopic and laparoscopic skills, and it has been suggested that video game skills correlates with laparoscopic surgical skills.

OBJECTIVE

The aim of the present study was to assess the influence of video game as warm-up before dry-lab laparoscopic activities.

METHODS

Eleven medical students and surgery residents from Faculdade de Medicina do ABC (Table 1) participated in this prospective randomized crossover study. Students were divided into two groups (1 versus 2). Students in Group 1 had to execute an interrupted suture with the dominant hand using a standardized technique (non-VG group). Students in Group 2 had to perform the same suture, but after playing a video game match (Winning Eleven Pro Evolution Soccer 2009 by Konami, at Sony PlayStation 3) (VG group). After this initial task, groups were crossed, and students in Group 1 had to play a video game match before a second round of laparoscopic sutures (VG group), while students in Group 2 had to perform a laparoscopic suture without the warm-up video game (non-VG group).

The time spent to complete each task was recorded, and the participants and observers had to judge the performance for each laparoscopic exercise, and these variables were used as a measure of performance. Attempts lasting longer than 600 seconds were stopped and recorded as 600 seconds. Statistical analysis was performed using the Statistical Package for Social Sciences software (SPSS 13.0 for Mac OS X, SPSS, Inc., Chicago, Illinois). Student’s t-test was used to compare means; χ² to compare categorical outcome variables. Statistical significance was determined at p value inferior to 0.05.

RESULTS

Table 1 shows the demographic data of the participants. Table 1. Demographic characteristics of participants

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of subjects</td>
<td>11</td>
</tr>
<tr>
<td>Age (mean ± sd)</td>
<td>25.1 ± 3.4</td>
</tr>
<tr>
<td>Male / Female</td>
<td>9 / 2</td>
</tr>
<tr>
<td>Handedness (R/L)</td>
<td>10 / 1</td>
</tr>
</tbody>
</table>

Mean time for laparoscopic surgery in this subset of inexperienced laparoscopic students was similar between non-VG versus VG groups (254.6 ± 187.7 versus 255.8 ± 183.6, p = 0.875). Subjective impression of observers regarding student’s performance was also similar in the comparisons between groups (p = 0.662). Subjective impression of the participant about his own performance differed between groups, with 64.7 versus 20.0% of participants considering their performance good for VG versus non-VG groups, respectively (p = 0.044).

DISCUSSION

A population of surgeons without any laparoscopic skills was studied as a strategy to have a uniform group of participants. Previous studies have compared participants with large video game experience and suggested that surgeons that played longer periods of video game had better skills for laparoscopic surgery. A recent study failed to demonstrate this association between prior video game experience and acquisition of robotic-assisted laparoscopic surgery skills.

This study has some important findings. Firstly, different from other studies, the effect of a single match of video game as a warm-up for a single laparoscopic exercise was evaluated. Likewise other authors, we failed to demonstrate an objective effect of video game exposure in reducing the time spent to perform exercise and in observer subjective impression of the participant performance. However, video game warm-up seemed to have a positive effect in improving self-confidence. Participants of the VG group gave themselves significant higher grades for their performance. Self-confidence might be important to improve surgical results, and, therefore, could be beneficial in real-life surgical procedures.

Secondly, warmed-up surgeons may be more receptive for inherent difficulties of laparoscopic activities. Although objective parameters were similar for VG versus non-VG groups, the former felt more comfortable performing the exercises. It can be valuable in skills labs, helping to introduce laparoscopic practice to inexperienced surgeons without discouraging them.

Our study presented several limitations. The number of participants was small, what limits the power of the
study. However, this is a preliminary study, and a larger one, assessing the effects of video games in surgical skills acquisition and warm-up, is being currently conducted. Also, we only tested warm-up with a single video game. It has previously been suggested that different games may have distinct impacts on surgical skills\(^5\). For this reason, larger studies with different video games tested may bring additional information. However, to the best of our knowledge, this was the first study that evaluated video games as warm-up methods prior to laparoscopic surgery, that is, it is the initial step for further studies.

**CONCLUSIONS**

In conclusion, video games used as warm-up for laparoscopic practice seem to make inexperienced surgeons more confident and comfortable with the procedures, even though objective measures, as operative time and observer impression of surgeon performance, do not seem to be influenced by video game warm-up.

**REFERENCES**


