EMF

1

Oral Tadalafil Speeds Reepithelialization and Reduces Depth of Partial Thickness Porcine Burns

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Study Objectives: Burns, unlike mechanical wounds, are characterized by secondary injury progression due to reduced dermal microcirculation, inflammation, and oxidative stress. The vertical progression of injury delays healing or reepithelialization and increases scar formation. There are no current FDA-approved therapies to reduce burn injury vertical progression. Previous study in a rat comb model demonstrated that tadalafil, a phosphodiesterase 5 inhibitor used as a vasodilator to treat erectile dysfunction, reduces necrosis in the unburned interspaces compared with naproxen, NAC, or their combination. In this study, we tested whether tadalafil speeds reepithelialization and reduces scarring of deep partial thickness burns in a validated vertical progression porcine burn model.

Methods: A validated animal burn model was used to create 60 deep partial thickness burns on the backs and flanks of anesthetized domestic pigs (25-30 kg) using an aluminum bar preheated to 80 degrees C for 20 seconds. After removing necrotic epidermis from the wounds to simulate blister formation and rupture, the pigs were randomly treated with 2.5mg oral tadalafil or a placebo within one hour of injury and once daily thereafter for six days, totaling seven treatments. All wounds were dressed, covered, and treated with topical triple antibiotic ointment every other day. Periodic imaging and full thickness biopsies were conducted to monitor healing over 28 days. Biopsies were subjected to histomorphometric analysis by a board-certified dermatopathologist masked to treatment assignment.

Results: The mean (SD) percentage wound reepithelialization of burns treated with tadalafil (n=60) and control (n=60) at days 15 and 18 were 91.6(25.4)% vs 43.5 (45.8)% and 96.4 (15.8)% vs 75.7 (38.7)% (p<0.001 for both). The median (IQR) time to complete wound reepithelialization was a significant 3 days faster in burns treated with tadalafil, at 15 (15-15) vs 18 (15-28) days, p<0.001. After 28 days, scar depth was significantly less in burns treated with tadalafil (2.7±0.4 mm versus 3.7±0.6mm, p=0.005). There were no wound infections or systemic adverse events in any of the wounds or animals respectively.

Conclusion: Seven once-daily treatments of oral tadalafil speeds reepithelialization and reduces scarring in porcine deep partial thickness burns.

EMF

2

The Sex Gap: A Multisite, Mixed Method Study Exploring Sex Differences in Feedback to Emergency Medicine Trainees

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Study Objectives: A sex disparity exists in the assessment of emergency medicine (EM) residents, with males receiving significantly higher ratings across all milestone competencies as compared to females throughout residency training. Reasons for this disparity are multifactorial and incompletely understood, although implicit (ie, unconscious) bias may play a role. In order to design an effective intervention to address this evaluation inequity, studies better assessing the context and content of evaluator feedback are needed. We conducted a multi-site qualitative study examining evaluation comments provided to EM residents in order to better understand the sex assessment gap, and inform the future design of interventions to reduce this gap.

Methods: We performed a qualitative analysis of clinical evaluation comments written by EM faculty and provided to male and female EM residents from five EM training programs in Oregon, Iowa, Washington, Alabama, and Pennsylvania. All available comments from emergency medicine clinical experiences, spanning July 1, 2017 to June 30, 2018, were analyzed using a robust, inductive approach to identify emerging themes. The written comments were de-identified for names and sex-specific pronouns prior to coding. As a guard against confirmation bias, coding was performed by a non-study team member; specifically, it was completed by the Mixed Method Research Lab at the University of Pennsylvania (a lab that provides high quality qualitative research expertise). A multi-stage, multi- analyst iterative process was employed with (1) review of the data set to develop and revise the code book, (2) review of the data set to code using an axial coding approach to discover emerging themes, and (3) a separate coder to achieve validation of the results.

Results: A total of 332 faculty members (66% male, 34% female) provided 7,226 written comments to 182 residents (59% male, 41% female) during the study period (July 1, 2017 to June 30, 2018). Analysis of the comments revealed three major disparities in the type of feedback received from residents by faculty: (1) Female residents, compared to male residents, received less feedback related to management style specifically within: efficiency (68% female vs 82% male), productivity (62% female vs 72% male), and team orientation (62% female vs 74% male), (2) Female residents, compared to male residents, received less feedback comments related to clinical practice specifically within: bedside manner (47% female vs 57% male), care planning (66% female vs 81% male), and differential diagnosis (47% female vs 59% male), (3) Female faculty, compared to male faculty, gave more feedback related to personal characteristic specifically within demeanor (57% female vs 37% male), level of compassion (37% female vs 26% male), and resiliency (38% female vs 23% male).

Conclusion: This qualitative analysis provides strong evidence of sex-based disparities that exist in feedback to emergency medicine residents. Training programs can use the results of this analysis to develop a framework to assess for disparities within their feedback process and interventions to help improve this feedback inequity.

EMF

3

Telemedicine Facilitation of Transfer Coordination from Emergency Departments

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Study Objectives: Telemedicine increasingly is being used for clinical emergency medicine, including the transfer process between emergency departments (EDs). The characteristics of EDs that use telemedicine for transfer coordination have not been described. Our primary objective was to describe characteristics of EDs that use telemedicine for transfer coordination and the way in which it is used. We also characterized characteristics of EDs using telemedicine for transfer coordination to those that use telemedicine for stroke or pediatric care.

Methods: Using data from the 2016 NEDI-USA survey, we identified all EDs that either provided or received telemedicine services. A follow-up survey was sent to all EDs that received telemedicine for transfer coordination and included questions characterizing ED staffing and transfer patterns. We also sent follow-up surveys to EDs that received telemedicine for other applications (eg, telestroke). Our outcome of interest was the way in which EDs used telemedicine for transfer coordination. We used descriptive statistics to characterize EDs and the way in which telemedicine is used for transfer coordination. Chi-square, Fisher’s exact, and Wilcoxon rank-sum tests were used for bivariate comparisons, as appropriate. Multivariable logistic regression analysis was used to identify ED characteristics independently associated with EDs’ use of telemedicine for transfer coordination.

Results: From the 2016 NEDI-USA, we identified 2,362 EDs that received telemedicine services and 160 (4% [95% CI, 3-4%] of 4,411 EDs that responded to a question about telemedicine) received telemedicine for transfer coordination. Of these 160 EDs, 141 (88%) responded to the follow-up survey and 133 of these confirmed their receipt of telemedicine for transfer coordination on the follow-up survey. Thirteen additional EDs reported that they received telemedicine services for transfer coordination on a separate follow-up survey. Among these 146 EDs using telemedicine for transfer coordination, 79 (54%) reported using telemedicine to assist with clinical care for local admission, 117 (80%) to assist with clinical care prior to transfer, and 92 (63%) for arranging transfer to a different hospital than the telemedicine provider. In bivariate comparisons, relative to EDs using telemedicine for other applications, EDs using telemedicine for transfer coordination tended to be in a rural location (32% vs 73%, p<0.001), located in the Midwest (23% vs 62%, p<0.001), have lower annual ED volume (18,576 [IQR 7,520-37,959] vs 2,076 [IQR 892-7,076], p<0.001), and have lower numbers of physician full-time equivalents (5 [IQR 4-11] vs 2 [IQR 1-4], p<0.001). Among telemedicine-using EDs, rural and Midwest location variables were independently associated with use of telemedicine for transfer coordination in multivariable testing (Table).

Conclusions: Telemedicine is infrequently used for transfer coordination between EDs and is most often used to assist with clinical care prior to transfer. The use of telemedicine for transfer coordination may clarify the potential for ensuring effective systems of emergency care.