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Residents' Oral Competition

(Abstracts)

Contents

Emergency Airway Management in a Tertiary Trauma Centre: A 1-year Prospective Longitudinal Study

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Introduction: Emergency airway management can be associated with difficulties that can result in complications ranging from transient adverse events to long term neurological injury, need for surgical airway and death. (1) A series of Canadian multi-centre studies showed that adverse events are common in emergency airway management and that that they are associated with poor patient outcomes. (2,3) Multiple attempts at laryngoscopy are associated with increased complications. (1,2,3) At the study site, a tertiary care trauma centre, there is a paucity of data regarding emergency airway management. The objectives of this study are:

1. To enumerate the number of emergent intubations that occur annually
2. To quantify the incidence of first pass success
3. To quantify the incidence of adverse events associated with emergency airway management
4. To identify predictors of successful first pass intubation
5. To identify predictors of adverse events

Methods: Ethics approval was obtained from the local REB. We performed a single centre, prospective, observational study, including all adult patients (>17 years old) intubated in the Emergency Department, Intensive Care Units (ICU), in-patient wards or a diagnostic imaging suite. The Respiratory Therapy Department assists at all intubations, as such, the Respiratory Therapist (RT) liased with the physician responsible for the intubation to complete the data collection sheet. We collected additional data via chart review retrospectively. Data collection was shortened to 7-months due to the COVID-19 pandemic.

Results: In a 7-month period, there were 416 emergency intubations and a first pass success rate of 73.08%. First pass success rates varied widely between locations; ward intubations were the lowest with 57.5% completed successfully, followed by 66.1% in the ICU's and 84.3% in the Emergency Department. Hypotension and hypoxemia occurred in 57 (13.7%) and 48 (11.5%) patients, respectively. Direct laryngoscopy (DL) was used as the primary technique in 199 patients (47.8%) but varied significantly by location; Emergency Room (35.0%) compared to on the ward (89.4%). Failure of first pass intubation was associated with inexperienced operator (OR: 2.06, CI: 1.30 – 3.24), use of paralysis (OR: 0.36, CI: 0.23 – 0.56), direct laryngscopy (OR: 1.74, CI: 1.12 – 2.70), physiologic difficult airways (OR: 2.04, CI: 1.25 – 3.32) and location (any vs. ER). Paralysis was used in 260 (62.5%) of patients and was not associated with hypoxia (OR: 1.15, CI: 0.60 – 2.20) or hypotension (OR: 0.99, CI: 0.54 – 1.81).

Discussion: Emergency intubation is a frequently performed life-saving procedure. First pass success is associated with a number of modifiable factors and the rate of success varies

significantly between locations at the study hospital. Operator experience, choice of medications, and equipment used are associated with first pass success and are potential targets for efforts to improve rates of successful first pass emergency airway management.

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Front of Neck Access (FONA): A Survey of Teaching Curriculums Among Canadian Anesthesiology Residency Programs

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Introduction: Front of Neck Access (FONA) is an emergency procedure that involves securing an airway through the anterior neck to facilitate alveolar oxygenation [1]. It is a last resort intervention in the cannot intubate, cannot oxygenate (CICO) scenario. The way FONA is taught during residency training is important, especially given that education and training have been implicated as significant causal factors in major airway complications [2].

Among various FONA techniques, scalpel-bougie-tube is the preferred method described in the most recent Difficult Airway Society guidelines. However, Canadian anesthesiologists have demonstrated a preference for needle techniques [3], despite its proven lower success rate [4, 5]. Given this discrepancy, we sought to determine if Canadian anesthesia residents are taught FONA techniques based on the most recent guidelines or anesthesiologist preference.

Methods: An 11-item questionnaire was developed to survey Canadian anesthesiology residency curriculums based on two domains: (1) preferred techniques of FONA taught to residents in adult and pediatric anesthesia, and (2) the duration, timing, and methods of teaching. Local ethics board approval was obtained.

Program directors of all 17 Canadian residency programs were contacted to inquire about survey completion. Surveys were distributed via email link and completed voluntarily by program director or residency curricular leads from January - June 2020. Three reminder emails were sent encouraging survey completion. Results were analyzed descriptively, using counts and percentages.

Results: Of 17 surveys distributed to Canadian anesthesia residency programs, 14 (82%) were returned.

In adult anesthesia, cricothyroidotomy by scalpel-bougie method was most commonly selected (n=10, 71%) as the preferred method of FONA taught to residents for the CICO scenario; cricorthyroidotomy by scalpel open-surgical methods (n=3, 21%) and wire-guided (seldinger) method (n=1, 7%) were also selected. In pediatric anesthesia, deferring to tracheostomy by surgeon was most commonly selected as the preferred method for FONA (n=6, 43%); cricothyroidotomy by a variety of other techniques were also selected.

Discussion: Based on a nationwide survey from 2014, Canadian anesthesiologists have previously demonstrated a preference for intravenous catheter and wire-guided techniques for FONA [3]. In contrast, the results of this survey demonstrate that most Canadian residency programs in anesthesiology (13/14, 93% of respondents) prefer to teach open surgical methods including scalpel-bougie technique for adult FONA.

It is notable and perhaps reassuring that the majority of residency programs are favouring scalpel techniques, given its superior speed and success rate in the emergency setting [1,4,5]. Nevertheless, this preference is not unanimous, with one program selecting a preference for wire-guided methods. This finding may speak to the known preference for non-surgical

techniques among Canadian anesthesiologists that still permeates to teaching at the resident level. Alternatively, it may speak to the ongoing debate that still remains regarding optimal FONA technique [1].

In pediatric FONA, the results of our survey were more varied, which may parallel the equivocal evidence in the literature.

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Introduction of the Serratus Anterior Plane Catheter with Programmed Intermittent Bolus for Minimally Invasive Cardiac Surgery: A Retrospective Study

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Introduction/Background: Minimally invasive heart surgery (MIHS) is rapidly progressing with proposed benefits over sternotomy including reduced recovery time, inflammatory response and transfusion requirements[1-3]. In addition to the surgical ports, MIHS requires a mini-thoracotomy in the 4-5th intercostal space resulting in significant postoperative pain for which regional anesthetic techniques may be used. One such technique is the serratus anterior plane (SAP) block, which has been described previously for thoracic surgery and MIHS[4-9]. The objective of this study was to compare postoperative analgesia efficacy and opioid consumption, as well as clinical outcomes between patients that did and did not receive SAP catheters.

Methods: REB approval was obtained from the local REB for this retrospective cohort study comparing analgesic control and patient outcomes from May 2017 until May 2020 in patients undergoing MIHS at a single cardiac surgery center. Clinical use of the SAP block and catheters was started in November 2018. Patients were excluded if they were less than 18 years of age, had incomplete documentation of anesthetic technique, conversion from MIHS to open or a surgical procedure within 72 hrs of the index surgery. Continuous data are expressed as means and standard deviations for variables with normal distribution and as medians and interquartile ranges (IQR) otherwise. Groups were compared using unadjusted t-tests and logistic regression models (adjusted for age, sex and BMI) or fisher's exact tests as appropriate. A value $p \leq 0.05$ was considered significant for differences between the two groups.

Results: There were 115 patients that met inclusion during the study period (41 in the SAP catheter group and 74 in the control group). Demographic data were balanced between the two groups. After adjusting for age, sex and body mass index, there was no difference in opioid consumption (OR: 0.995, 95% CI: 0.990 - 1.000) , pain score at extubation (OR: 0.93, 95% CI: 0.789 – 1.098) average pain score in the first 24 hours after surgery (OR: 0.869, 95% CI: 0.702 – 1.077), Intensive Care Unit length of stay (OR: 0.990, 95% CI: 0.773 0 1.268) or hospital length of stay (OR: 0.998, 95% CI 0.904 – 1.101) between groups. There was a significant decrease in opioid related side effects in the SAP group (OR: 2.702, 95% CI: 0.773- 1.268). As well, the duration of post-operative intubation was 218 minutes shorter in the SAP group compared to the usual care group (OR: 0.998, 95% CI: 0.904 – 0.999).

Discussion: We have shown that patients undergoing MIHS who have a SAP catheter placed for post-operative analgesia do not have a decrease in opioid consumption, pain at extubation or pain scores. They do experience less time intubated and have less opioid related adverse effects.

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PreWarming to Prevent Perioperative Hypothermia in Short Duration Outpatient Surgery Under General Anesthesia: a Randomized Comparison Study

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Introduction: Prevention of perioperative hypothermia is a major challenge as hypothermia leads to adverse outcomes such as wound infections, coagulopathy, delayed recovery and cardiac events (1,2). The heat redistribution from central to peripheral compartment is the main mechanism of early heat loss under general anesthesia (GA), and a 30-minutes forced-air prewarming (PW) minimizes this phenomenon (3,4). The actual trend for fast-tracking surgery demands an aggressive perioperative temperature control. Therefore, as intraoperative active warming is limited during short duration outpatient surgeries, it seems pertinent to evaluate the impact of PW. The goal of this study was to evaluate, in short duration outpatient surgeries and compared to standard care, if the use of PW will impact patients' core temperature at the end of surgery.

Methods: After ethic approval, 60 adult patients scheduled for outpatient, short surgery (30-120min) under GA were randomized to PW Group (PWG) using a forced-air warming system (Flex gown, BairPaw system, 3M^{TM}) for at least 30 minutes preoperatively, or to control group (CG, standard care). CG received passive isolation with warm blankets. Intraoperative forced-air warming blankets (BairHugger, 3M^{TM}) were used for both groups. Perioperative temperatures were measured using the SpotOn 3M^{TM} system. The primary outcome was the patients' temperature at the end of the surgery (T_{end}). Secondary outcomes included: intraoperative temperature drop from OR entry (T_0) to the lowest intraoperative temperature (T_{nadir}), incidence of hypothermia (< 36°C), patient comfort level, length of stay (LOS) in PACU, and incidence of postoperative shivering.

Results: 57 patients were analyzed (29 PWG; 28 CG). Demographic data and patients' basal temperature (T_{basal}) were similar. The T_0 were comparable between PWG and CG (*37.1°(0.3) vs 36.9°(0.4) respectively; p=0.129*). PWG showed a higher T_{end} compared to CG patients *(36.7°(0.4) vs 36.3°(0.4); p<0.001)*. The temperature drop was less in PWG compared to CG *(-0.7°(0.3) vs -0.9°(0.3); p=0.044)*. The incidence of intraoperative hypothermia was not different *(PWG: 21% vs CG: 43%; p=0.072)*. The patients' comfort level on a 0-10 Likert scale was higher in PWG compared to CG (*10 [8-10] vs 7.5 [6.25-9] respectively; p=0.0005*). There was no difference in LOS nor in the incidence of shivering in PACU.

Discussion: Compared to standard care, a minimum of 30-minutes continuous forced-air PW was effective in maintaining higher core temperature by the end of a short duration outpatient surgery. National Institute for Care and Health Excellence defined as clinically relevant a perioperative difference of 0.5°C in core temperature over 36°C (5). Thus, the present 0.4°C gain, when using PW, is relevant in short surgery, as intraoperative warming is limited. Moreover, PW increases patients' comfort and slightly reduces the incidence of hypothermia.

Not surprisingly, the incidence of shivering and the length of stay in PACU were unchanged for this type of short surgery.

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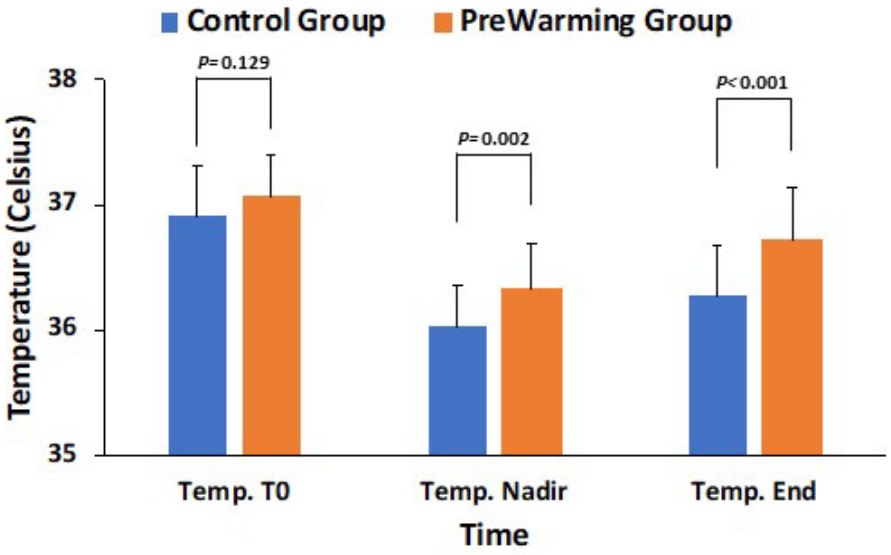

The Impact of Shared Familial Chronic Pain Experiences on Healthcare Utilization

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Introduction: Chronic pain is highly prevalent across Canada and a large proportion of chronic pain patients do not suffer in isolation. There is a significant amount of research examining the impact of chronic pain on family members, when a sole member has a chronic pain condition. However, little research has examined the impacts of having multiple family members with a chronic pain condition. We first aimed to examine pain-related and mental health characteristics among chronic pain patients with a family member with chronic pain (spouse, child, sibling, or other relative) compared to those without. We further aimed to examine associations between having a family member with chronic pain on pain-related healthcare utilization.

Methods: Ethics approval was obtained from the local REB to gain access to self-reported data from a comprehensive Patient Intake Questionnaire (PIQ) completed by outpatients entering the Chronic Pain Clinic at a tertiary hospital between January 20, 2015 and February 12, 2018. Patients self-reported whether they had a family member with a chronic pain condition and completed validated self-report measures on indicators of chronic pain status (pain severity, pain interference), mental health (depressive features, pain catastrophizing), and healthcare utilization (medication use, healthcare encounters, specialists, imaging and tests). The primary analysis included multivariable logistic and linear regression models controlling for sociodemographic characteristics (age, sex, highest level of education completed) and duration of the chronic pain condition.

Results: 367 chronic pain patients were retrospectively identified and 339 were included in analyses, with 44% having a family member with chronic pain. Pain severity, pain interference, pain catastrophizing, and depression scores did not significantly differ between those with and without a family member with chronic pain, and there were no significant differences according to type of family member. There were differences amongst the subgroups in the type of specialists seen (Chi-square value = 9.51, $p < 0.05$) with the highest proportion of those seeking alternative therapies among those who have a child or other family with chronic pain. Having a family member with chronic pain, particularly close members (e.g. child or spouse), was also associated with increased hospital admissions for that individual ($H(4) = 11.184$, $p < 0.05$).

Discussion: Having shared chronic pain experiences with a family member may influence pain-related healthcare utilization (e.g. medication use, seeking alternative specialists and therapies, hospital admissions). Based on the trends observed, the type of familial relationship may play a key role. Determining the impact that various familial relationships have on healthcare utilization will allow for the development of targeted interventions catered towards families and will ascertain whether differences in use translate to differences in healthcare services satisfaction and/or treatment outcomes.

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Table 1. Sample characteristics

	Family member with CP	No family member with CP	Spouse with CP	Child with CP	Sibling with CP	Other family member
n (%) of total sample	149 (44.0%)	190 (56.0%)	17 (5.1%)	17 (5.1%)	36 (10.7%)	75 (22.4%)
Age (*M, SD*)	52.97 (14.61)	55.41 (14.48)	62.29 (8.84)	67.4 (10.40)	59.03 (11.66)	44.34 (12.31)
Sex						
Male	54 (36.2%)	82 (43.2%)	9 (52.9%)	5 (29.4%)	9 (25.0%)	31 (41.3%)
Female	95 (63.8%)	108 (56.8%)	8 (47.1%)	12 (70.6%)	27 (75.0%)	44 (58.7%)
Education						
High school or less	82 (55.8%)	99 (53.2%)	12 (70.6%)	11 (64.7%)	20 (55.6%)	38 (52.1%)
Some college or higher	65 (44.2%)	87 (46.8%)	5 (29.4%)	6 (35.3%)	16 (44.4%)	35 (47.9%)
Employment status						
Employed	68 (45.6%)	54 (28.6%)	10 (58.8%)	15 (88.2%)	22 (61.1%)	32 (42.7%)
Unemployed	81 (54.4%)	135 (71.4%)	7 (41.2%)	2 (11.8%)	14 (38.9%)	43 (57.3%)
Marital status						
Single	26 (17.8%)	32 (17.4%)	0 (0%)	1 (5.9%)	3 (8.3%)	22 (30.1%)
Married/common-law	93 (63.7%)	117 (63.6%)	15 (93.8%)	12 (70.6%)	18 (50.0%)	45 (61.6%)
Widowed/separated/ divorced	27 (18.5%)	35 (19.0%)	1 (6.3%)	4 (23.5%)	15 (41.7%)	6 (8.2%)

Note. Values represent *n* (%); *M* = mean, *SD* = standard deviation; CP = chronic pain.
Continuous variables are represented as means and standard deviations and categorical groups as percentages.