Clinical Significance

Populations who are at higher risk for oral disease, which would include adolescents with orthodontic appliances in place, require targeted, practical oral hygiene strategies that can adapt to their particular challenges. Having personal wireless technology linking a power toothbrush with a smartphone is not only relevant to the generation that most often undergoes orthodontic treatment but works on both the clinical and the motivational aspects of providing oral care in this situation. By engaging the individual, the app can provide quantifiable health and cost benefits.

Erbe C, Klees V, Braunbeck F, et al: Comparative assessment of plaque removal and motivation between a manual toothbrush and an interactive power toothbrush in adolescents with fixed orthodontic appliances: A single-center, examiner-blind randomized controlled trial. *Am J Orthod Dentofacial Orthop* 155:462-472, 2019

Reprints available from C Erbe, Dept of Orthodontics, Univ Medical Ctr of the Johannes Gutenberg-Univ Mainz, Augustusplatz 2 55131 Mainz, Germany; e-mail: erbe@uni-mainz.de

ORAL SURGERY

Opioid prescribing protocol for third molar surgery

BACKGROUND

The United States is experiencing a tremendous surge in opioid overdoses and deaths that has been linked to the overprescription of opioids, which makes these drugs available for misuse, abuse, and diversion. Oral and maxillofacial surgeons, along with other dentists, are among the most prevalent prescribers of opioids. Evidence-based ways to diminish the excess prescription of opioids to dental patients while maintaining good management of postoperative pain are needed to guide the dental profession, as well as other prescribers. Broad guidelines are already in place to treat postoperative pain, but no procedure-specific guidelines have been developed for managing pain after third molar extraction. An opioid prescribing protocol was put into place in a university dental facility, and the effect on opioid prescribing behaviors was tracked.

METHODS

An opioid prescribing protocol specific to third molar surgery was put into place at the Division of Oral and Maxillofacial Surgery of the University of Minnesota, Minneapolis. The prescribing behaviors in the fourth quarter of 2015, before the protocol was in place, were compared with those behaviors in the fourth quarter of 2017, when the protocol was in effect. The retrospective analysis focused on 344 patients who underwent third molar extraction during the study period (Figure 1). The variables assessed included total number of postoperative opioid prescriptions written, number written for each procedure code, and number written per patient procedure. In addition, researchers documented the total number of postoperative opioid tablets prescribed, the number of tablets prescribed for each procedure code, the number of tablets prescribed for each patient undergoing each procedure code, and the average number of opioid tablets prescribed. The morphine milligram equivalent (MME) was calculated. All the variables were compared before and after the protocol was implemented.

RESULTS

Of the 344 patients who had third molar extraction during the study period, 173 were operated on before implementation of the protocol and 171 patients underwent surgery after the protocol was put into place. The surgery varied according to the patient's presentation and included surgical extraction, soft tissue impaction, partial bony impaction, or complete bony impaction.

Considerable changes in the number of opioid prescriptions were noted before and after implementing the protocol. Two hundred one prescriptions were written during the study period, with 164 (82%) written before the protocol and 37 (18%) written after. In addition, the various procedures differed in the number of opioid prescriptions written before and after implementation of the prescribing protocol, as did the number of tablets prescribed. Generally, increased surgical difficulty was identified as the rationale for prescribing opioids. Mean number of tablets per prescription was 15.9 in 2015 and 11.5 in 2017.

Notable changes were also seen in the number of nonopioid prescriptions written before and after the protocol was implemented. One hundred postoperative nonopioid prescriptions

University of Minnesota School of Dentistry
Acute Postoperative Pain Opioid Prescribing Guidelines

If NSAIDS can be tolerated:

Pain Severity	Analgesic Recommendation
Mild	Ibuprofen (200-400 mg) q4-6 hours prn for pain
Mild to Moderate	**Step 1:** Ibuprofen (400-600 mg) q6 hours: fixed intervals for 24 hours **Step 2:** Ibuprofen (400 mg) q4-6 hours prn for pain
Moderate to Severe	**Step 1**: Ibuprofen (400-600 mg) with APAP (500 mg) q6 hours: fixed interval for 24 hours **Step 2**: Ibuprofen (400 mg) with APAP (500 mg) q6 hours prn for pain
Severe	**Step 1:** Ibuprofen (400-600 mg) with APAP (650 mg) with (5mg) hydrocodone q6 hours: 3-day supply. **Step 2:** Ibuprofen (400-600 mg) with APAP Ibuprofen (400-600 mg) with APAP (500 mg) q6 hours: prn for pain

If NSAIDS are contraindicated:

Pain Severity	Analgesic Recommendation
Mild	APAP (650-1000 mg) q6 hours prn for pain
Moderate	**Step 1:** APAP (650-1000 mg) with hydrocodone (5 mg) q6 hours: 3- day supply. **Step 2:** APAP(650-1000 mg) q4-6 hours prn for pain
Severe	**Step 1:** APAP (650 mg) with hydrocodone (5 mg) q6 hours: 3-day supply. **Step 2:** APAP(650-1000 mg) q6 hours: prn for pain

Figure 1. University of Minnesota School of Dentistry Acute Postoperative Pain Opioid Prescribing Guidelines. *APAP,* Acetaminophen; *NSAIDs,* nonsteroidal anti-inflammatory drugs; *prn,* when necessary. (Courtesy of Tompach PC, Wagner CL, Sunstrum AB, et al: Investigation of an opioid prescribing protocol after third molar extraction procedures. *J Oral Maxillofac Surg* 7:705-714, 2019.)

were written during the study period, with 9 (6%) written before implementation of the protocol and 134 (94%) written after. The specific third molar procedure performed also showed differences in the number of nonopioid prescriptions written before and after implementation of the prescribing protocol. For example, patients who had complete bony impaction procedures had no nonopioid prescriptions written for the lowest number and surgical extraction procedures had 56% nonopioid prescriptions written for the highest number. After the protocol was implemented, nonopioid prescriptions ranged from 9% for surgical extraction procedures to 43% for complete bony impaction procedures. Similar changes were noted for other procedures. Overall, 9 of 173 patients (5%) received a nonopioid prescription postoperatively in 2015 but 134 of 171 patients (78%) received one in 2017.

Overall, patients received a proportionately large number of nonopioid prescriptions even with more complicated surgical impaction challenges after the protocol was in place. In addition, surgeons who prescribed opioids did so at doses similar to those before the protocol was implemented but for a shorter postoperative period, consistent with the new protocol.

DISCUSSION

A small percentage of patients received postoperative nonopioids before the prescribing protocol was implemented. In

Clinical Significance

While reducing the number of opioid prescriptions and the number of tablets being prescribed, patients had their postoperative pain levels managed appropriately. No marked increase was found in after-hours calls, patient return visits, opioid prescription refills, or secondary prescriptions after the implementation of the opioid prescription protocol. Patients also are increasingly requesting nonopioid analgesics after third molar extraction. Putting a clear protocol for the use of opioids after third molar surgery appears to be an effective way to decrease the amount of opioid doses available for misuse, abuse, and diversion.

addition, a large percentage of patients received opioid prescriptions postoperatively before the protocol was in place. These data were flipped when the protocol was implemented, with surgeons prescribing more nonopioids and fewer opioids regardless of the procedure performed. The presence of an acute postoperative pain opioid prescribing protocol led to fewer opioid prescriptions, more consistency in prescribing behaviors among practitioners, and fewer opioid tablets prescribed per patient. Patient pain management was adequate to the need.

Tompach PC, Wagner CL, Sunstrum AB, et al: Investigation of an opioid prescribing protocol after third molar extraction procedures. *J Oral Maxillofac Surg* 7:705-714, 2019

Reprints available from PC Tompach, Div of Oral and Maxillofacial Surgery, Univ of Minnesota School of Dentistry, 7-174 Moos Health Sciences Tower, 515 Delaware St, SE, Minneapolis, MN 55455; e-mail: tompa001@umn.edu

PREGNANCY

Oral disorders in pregnant women

BACKGROUND

During pregnancy, women experience changes that can increase their susceptibility to the development of oral disorders. Progesterone, estrogen, and chorionic gonadotropin are related to greater vascular permeability and proliferation. In addition, changes in chemical mediators and the fibrinolytic system can produce a proinflammatory status. Higher hormone levels can change the oral microbiome, with stress and anxiety contributing to poor oral hygiene. The result can be the development of intraoral lesions. The most prevalent are pyogenic granuloma, gingival hyperplasia, oral candidiasis, cheek biting, benign migratory glossitis, aphthous ulcers, and telangiectasia. A systemic review was done to summarize and critically evaluate the evidence regarding the prevalence of oral mucosal disorders during pregnancy.

METHODS

The databases of CINAHL, LILCS, LIVIVO, PubMed, Scopus, Web of Science, Google Scholar, OpenGrey, and ProQuest were searched for observational studies that evaluated the prevalence of oral mucosal disorders during pregnancy. Fifteen studies met the inclusion criteria and were subjected to qualitative synthesis and meta-analysis. A total of 5935 participants were included. The prevalence of oral lesions in pregnant women was expressed by relative or absolute frequencies.

RESULTS

Participants ranged in age from 10 to 50 years. The prevalence of oral mucosal disorders varied widely from 0.22% to 31%. The primary lesions were gingival hyperplasia, seen in 11.4% of women; morsicatio buccarum, seen in 10%; oral candidiasis, seen in 4.7%; pyogenic granuloma, seen in 3.2%; and benign migratory glossitis, seen in 2.9%. The variation in prevalence among the articles was 2.9% to 25% for gingival hyperplasia, 0.22% to 16.6% for pyogenic granuloma, 3.5% to 31% for morsicatio buccarum, and 1% to 15% for oral candidiasis.

Overall prevalence rate for oral lesions was 11.8%. The prevalence on meta-analysis was 17.1% for gingival hyperplasia, 9.9% for morsicatio buccarum, 4.4% for oral candidiasis, 3% for pyogenic granuloma, and 2.8% for benign migratory glossitis.

DISCUSSION

About a tenth of the pregnant women had disorders of their oral mucosa, with gingival hyperplasia being the most common lesion seen. Dental professionals can help these patients achieve a proper diagnosis and receive care. In addition, they can offer education to pregnant women regarding oral health.