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Post-Discharge Complications of Dental Treatment in General Anesthesia Performed in a Day-Care Service

Komplikacije stomatološke sanacije u općoj anesteziji nakon otpusta iz sustava jednodnevne kirurgije

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Abstract

Objective: To review the frequency and management of post-discharge complications in patients who underwent dental treatment in general anesthesia (GA) in a day-care surgery setting and identify the factors that increase the risk for these complications. **Material and methods:** Anonymous questionnaire was sent to parents/caregivers of patients who underwent full mouth restoration in GA at our institution between 1st January 2017 and 31st July 2019. Demographic and clinical data of patients as well as the data about the occurrence and management of complications were collected. **Results:** Sixty-six parents/caregivers (30.5%) responded to the questionnaire. Most frequent complications were drowsiness and pain in 40(60.6%) patients. Complications were managed by parents or caregivers with conservative measures at home in 57(91.9%) cases. Phone consultation with dentist was required in 5(8.1%) cases. One patient (1.6%) was readmitted. Younger age and diagnosis were associated with increased risk for drowsiness. **Conclusion:** Post discharge complications of dental treatment in GA in a day-care service are common and they can be managed by parent/caregiver with conservative measures at home. The rate of readmission is low. Dental treatment in GA in a day-care service is a safe procedure that can be performed with acceptable risk in carefully selected patients.

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Introduction

Dental treatment in general anesthesia (GA) is usually performed as a last resort when other behavior management techniques fail. In spite of its advantages such as patients' unresponsiveness, postoperative amnesia, constant patient monitoring and optimal drug titration, dental treatment in GA carries increased risk for intra and postoperative complications compared to dental treatment in local anesthesia. Postoperative complications include nausea, vomiting, irritability and agitation, sleep impairment, pain, bleeding, sore throat etc. (1,2). The frequency of postoperative complications varies significantly between studies from negligi-

Uvod

Stomatološko liječenje u općoj anesteziji (OA) obično se primjenjuje kao zadnja opcija kada ne djeluju druge tehnike kontrole ponašanja. Unatoč prednostima poput mirnoće pacijenta, postoperativne amnezije i optimalne titracije lijekova, stomatološko liječenje u OA povećava rizik za intra i postoperativne komplikacije u usporedbi sa stomatološkim liječenjem u lokalnoj anesteziji. Postoperativne komplikacije obuhvaćaju mučninu, povraćanje, iritabilnost i uznemirenost, poremećaj spavanja, bol, krvarenje, grlobolju itd. (1, 2). Postotak postoperativnih komplikacija značajno varira od studije do studije – od zanemarivoga do više od 90 % pacijenata (3

ble number of patients to more than 90% of the patients (3–5). Therefore, the decision to treat the patient in GA is made when the benefit of dental treatment outweighs the risk of aforementioned complications. Postoperative complications are of special concern for day-care based procedures as they happen when a patient is no longer under medical supervision. In spite of that, they are usually mild and the rate of re-admissions is low (4,6).

Dental treatment in GA started at the Dental Clinic's day care service, University Clinical Hospital Zagreb in January 2017. By July 2019, more than 200 patients have undergone full mouth restoration. In our previous report we focused on patient characteristics, type of procedures and intraoperative complications (7). However, we had no data about the complications which happened after patients have left the hospital and were no longer under our supervision. We also wanted to know how these complications were managed and, most importantly, whether our treatment resulted in any significant complication that required hospitalization. Therefore, the aim of this paper was to review the frequency and management of post-discharge complications in patients who underwent full mouth restoration in GA in a day care surgery setting and to identify factors that increase risk for postoperative complications after dental treatment in GA.

Material and methods

The study was approved by the Ethics Committee of the University of Zagreb, School of Dental Medicine and University Clinical Hospital Zagreb. Anonymous questionnaire was sent by an email to the parents and caregivers of patients who underwent full mouth restoration in GA at the Dental clinic's day-care service, University Clinical Hospital Zagreb between 1st January 2017 and 31st July 2019. Since this was an online survey, participants did not sign the informed consent. Instead, they had to read the consent form and confirm their agreement before proceeding to the survey.

GA procedure consisted of target control infusion (TCI) anesthesia (propofol/remifentanyl), which was described in our previous report (7). Dental treatment included prophylactic cleaning, restoration of carious lesions, extraction of non-restorable teeth. The extraction site was infiltrated with local anesthetic (4% articaine with epinephrine 1:200000). Resorbable sutures were applied when necessary. Antibiotic treatment was introduced based on clinical judgement. After the procedure, patients were monitored in the recovery room and discharged based on anesthesiologist's and dentist's evaluation, usually 1.5-2 hours after the procedure. Parents and caregivers received oral and written instructions about related complications and their management from the attending dentist.

The questionnaire consisted of three parts. In the first part, general demographic and clinical data were collected (age, sex, year of treatment, diagnosis/reason for the treatment in GA, number of previous dental treatments in GA, number of extracted teeth, antibiotic and analgesic use). Second part of the questionnaire registered data about postoperative complications (type of complication, day of onset and

– 5). Zato se odluka o stomatološkom liječenju u OA donosi kada dobrobit stomatološkog liječenja nadilazi rizik od navedenih komplikacija. Postoperativne komplikacije poseban su problem za zahvate u jednodnevnoj kirurgiji jer se događaju kada pacijent više nije pod medicinskim nadzorom. Unatoč tomu, obično su blage i postotak ponovnog dolaska u bolnicu je nizak (4, 6).

Stomatološko liječenje u OA započeto je u Zavodu za jednodnevnu kirurgiju KBC-a Zagreb u siječnju 2017. Do srpnja 2019. više od 200 pacijenata bilo je podvrgnuto potpunoj stomatološkoj sanaciji. U prethodnom radu fokusirali smo se na karakteristike pacijenata, tip zahvata i intraoperativne komplikacije (7). Međutim, nismo imali podatke o komplikacijama koje su se događale nakon što bi pacijenti napustili bolnicu i nisu više bili pod našim nadzorom. Uz to, zanimalo nas je kako su navedene komplikacije bile liječene i najviše od svega, je li naše liječenje rezultiralo značajnim komplikacijama koje bi zahtijevale hospitalizaciju. Zato je svrha ovog istraživanja bila ispitati frekvenciju i liječenje komplikacija nakon otpusta pacijenata podvrgnutih stomatološkoj sanaciji u OA u sustavu jednodnevne kirurgije i identificirati čimbenike koji povećavaju rizik od postoperativne komplikacije poslije stomatološkog liječenja u općoj anesteziji.

Ispitanici i postupci

Istraživanje je odobrilo Etičko povjerenstvo Stomatološkog fakulteta Sveučilišta u Zagrebu i KBC-a Zagreb. Anonimni upitnik poslan je elektroničkom poštom roditeljima i skrbnicima pacijenata koji su bili na stomatološkom liječenju u OA u Zavodu za jednodnevnu kirurgiju KBC-a Zagreb od 1. siječnja 2017. do 31. srpnja 2019. Budući da je bila riječ o online istraživanju, sudionici nisu potpisivali informirani pristanak. Umjesto toga trebali su pročitati tekst informiranog pristanka i potvrditi da su suglasni prije nego što nastave s ispunjavanjem upitnika.

Postupak OA sastojao se od *target control infusion* (TCI) anestezije (propofol/remifentanyl) koji je opisan u našem prijašnjem radu (7). Stomatološka sanacija obuhvaćala je uklanjanje mekih i tvrdih naslaga, profilaktičko pečačenje fisura, restauraciju karijesnih lezija i ekstrakciju zuba koji se nisu mogli sanirati. Mjesto ekstrakcije infiltrirano je lokalnim anestetikom (4-postotni artikain s adrenalinom 1 : 200 000). U slučaju potrebe postavljeni su resorptivni šavovi. Antibiotička terapija ordinirana je na temelju kliničke procjene. Nakon zahvata pacijenti su promatrani u sobi za oporavak i otpušteni na temelju procjene anesteziologa i stomatologa, u prosjeku od 1,5 do 2 sata poslije zahvata. Roditelji/skrbnici dobili su od stomatologa usmene i pismene upute o postupanju nakon zahvata, komplikacijama i njihovu liječenju.

Upitnik se sastojao od triju dijelova. U prvom dijelu prikupljali su se opći demografski i klinički podatci (dob, spol, godina liječenja, dijagnoza/razlog za liječenje u OA, prijašnja stomatološka liječenja u OA, broj ekstrahiranih zuba, upotreba antibiotika i analgetika). U drugom dijelu bilježili su se podatci o postoperativnim komplikacijama (vrsta komplikacije, početak i trajanje). U trećem dijelu ispitivali smo nači-

duration). In the third part we assessed the management of postoperative complications and the need for readmission.

The data were organized into Microsoft Excell (Microsoft Excel, Microsoft Inc., USA) spreadsheets. SPSS 11.0 software (IBM Inc., USA) was used for statistical analysis. Distribution of the data was tested by the Kolmogorov-Smirnov test. Due to non-normal distribution of the data, the Kruskal Wallis test was used to assess differences between linear variables and the chi-square test was used to assess differences between categorical variables. To identify factors associated with increased risk of postoperative complications, a logistic regression analysis was used. Patient's age, diagnosis, dental extractions and antibiotic treatment were used as control variables, and p value lower than 0.05 ($p < 0.05$) was considered statistically significant.

Results

The questionnaire was sent to 216 parents and caregivers. The response rate was 30.5% (66 respondents). The majority of patients were males (43/65.2%). The median age of the patient was 10 (4-37). For the majority of the patients (46/69.7%), this was the first time they have undergone dental treatment in GA. The most common reason for the treatment in GA was autism (26/39.4%), followed by cerebral paralysis (10/15.1%) and mental retardation (7/10.6%). Demographic and clinical characteristics of the patients are displayed in Table 1.

Postoperative complications and their frequencies are presented in Table 2. Most commonly reported complications were drowsiness and pain, both reported in 40 (60.6%) patients. A significantly higher frequency of cough and epistaxis was found among patients who underwent dental treatment due to severe gag reflex compared to other diagnoses ($p=0.019$ and 0.034 , respectively). Difficulty eating was significantly more reported among patients who underwent dental extractions compared to the patients who did not ($p=0.021$). No significant difference in the frequency of complications was found between the patients who were prescribed antibiotics compared to those who were not. Furthermore, no significant difference in the frequency of complications was found between patients who underwent dental treatment for the first time compared to those who had previously undergone dental treatment(s) in GA (Table 2).

Complications occurred on the day of the procedure in 41 (61.9%) patients, 1 day after the procedure in 16 (23.8%) patients, 3 days after the procedure in 6 (9.5%) patients and 4 days after the procedure in 3 (4.8%) patients (Table 3). Median duration of complications was 2 (1-8) days. Sixty-two parents or caregivers responded about the management of complication(s). In 57 (91.9%) patients, complications were managed independently by parents or caregivers with conservative measures at home (analgesics and/or local measures - ice packs, compression etc.). Phone consultation with the dentist or general medical practitioner was required in 5 (8.1%) cases. Out of these 5 patients, one patient (1.6%) was admitted to the hospital. This patient was a 7-year-old boy with cerebral paralysis who developed fever, nausea and vom-

ne liječenja komplikacija i potrebu za ponovnim primitkom u bolnicu.

Podatci su organizirani u Excell datotekama (Microsoft Excel, Microsoft Inc., SAD) Microsofta. Program SPSS 11.0 (IBM Inc., SAD) korišten je za statističku analizu. Normalnost distribucije ispitana je Kolmogorov-Smirnovljevim testom. Zbog odstupanja od normalne distribucije, za ispitivanje razlika između linearnih varijabli korišten je Kruskal Wallisov test za neovisne uzorke, a za ispitivanje razlika između kategoričkih varijabli hi-kvadrat test. Za identifikaciju čimbenika povezanih s povećanim rizikom od postoperativnih komplikacija korištena je logistička regresija. Dob pacijenta, dijagnoza, ekstrakcije zuba i antibiotska terapija bile su kontrole varijable. Statistički značajnima smatrane su p vrijednosti ispod 0,05 ($p < 0,05$).

Rezultati

Upitnik je poslan na adrese elektroničke pošte 216 roditelja i skrbnika. Postotak odgovora bio je 30,5 % (66). Većina pacijenata bila je muškog spola (43/65,2 %). Medijan dobi iznosio je 10 godina (raspon 4 – 37). Za većinu pacijenata (46/69,7 %) bio je to prvi put da su stomatološki liječeni u OA. Najčešći razlog za takvo liječenje bio je autizam (26/39,4 %), pa cerebralna paraliza (10/15,1 %) i mentalna retardacija (7/10,6 %). Demografske i kliničke karakteristike pacijenata prikazane su u tablici 1.

Učestalost postoperativnih komplikacija prikazana je u tablici 2. Najčešće komplikacije bile su ošamućenost i bol – obje je navelo 40 pacijenata (60,6 %). Kašalj i epistaksa zabilježeni su u statistički značajno višem postotku kod pacijenata koji su liječeni u OA zbog teškog refleksa na povraćanje u usporedbi s drugim dijagnozama ($p = 0,019$ i $0,034$). Otežano jedenje zabilježeno je u statistički značajno višem postotku među pacijentima kojima su ekstrahirani zubi u odnosu prema onima kojima zubi nisu izvađeni ($p = 0,021$). Nisu utvrđene statistički značajne razlike u frekvenciji komplikacija između pacijenata kojima je ordinirana antibiotska terapija i onih kojima nije propisana. Nadalje, nisu utvrđene statistički značajne razlike u frekvenciji komplikacija između pacijenata koji su bili prvi put stomatološki liječeni u OA u usporedbi s onima koji su već bili tako liječeni (tablica 2.).

Komplikacije su se pojavile na dan zahvata u 41 pacijenta (61,9 %), jedan dan nakon zahvata u 16 pacijenata (23,8 %), tri dana nakon zahvata u šest pacijenata (9,5 %) i četiri dana nakon zahvata u tri pacijenta (4,8 %) (tablica 3.). Medijan trajanja komplikacija iznosio je dva dana (1 – 8). Na pitanje o liječenju komplikacija odgovorila su 62 roditelja/skrbnika. Komplikacije 57 pacijenata (91,9 %) samostalno su kod kuće konzervativnim mjerama liječili roditelji/skrbnici (analgetici i/ili lokalne mjere – hladni oblozi, kompresija). U pet slučajeva (8,1 %) konzultirali su se telefonom sa stomatologom ili liječnikom obiteljske medicine. Od tih pet slučajeva, jedan pacijent (1,5 %) bio je primljen u bolnicu. Bio je to 7-godišnji dječak s cerebralnom paralizom koji je dobio povišenu tjelesnu temperaturu, osjećao je mučninu i povraćao je dan poslije zahvata. Pacijentu je izvađeno devet zuba i ordinirana je antibiotska terapija.

Table 1 Demographic and clinical characteristics of the patients
Tablica 1. Demografske i kliničke karakteristike ispitanika

Seks • Spol N (%)		
	Female • Ženski	23 (34.8)
	Male • Muški	43 (65.2)
Age • Dob median (range)		10 (4-37)
Diagnosis/ Reason for dental treatment in general anaesthesia • Dijagnoza / Razlog za stomatološko liječenje u općoj anesteziji N (%)		
	Healthy, noncompliant patient • Zdrav, nesuradljiv pacijent	3 (4.5)
	Autism • Autizam	26 (39.4)
	Cerebral paralysis • Cerebralna paraliza	10 (15.1)
	Mental retardation • Mentalna retardacija	7 (10.6)
	Down syndrome • Downov sindrom	2 (3.1)
	Extreme dental phobia • Ekstremna dentalna fobija	2 (3.1)
	Severe gag reflex • Teški refleksi na povraćanje	1 (1.5)
	Medically complex patient • Medicinski kompleksan bolesnik	6 (9.1)
	Procedure too extensive for local anaesthesia • Preopsežan zahvat za lokalnu anesteziju	9 (13.6)
First time in general anaesthesia • Prvi put u općoj anesteziji N (%)		
	Yes	21 (31.8)
	No	45 (68.2)
First dental treatment in general anaesthesia • Prvi stomatološki zahvat u općoj anesteziji N (%)		
	Yes	46 (69.7)
	No	20 (30.3)
Dental extractions • Ekstrakcije zuba N (%)		
	Yes	53 (80.3)
	No	13 (19.7)
No. of extracted teeth • Broj ekstrahiranih zuba median (range)		2 (0-18)
Antibiotic therapy • Antibiotičko liječenje N (%)		
	Yes	35 (53)
	No	30 (45.5)
	Missing	1 (1.5)
Analgesic therapy • Liječenje analgeticima		
	Yes	40 (60.6)
	No	26 (39.4)
Duration of analgesic therapy (days) • Trajanje liječenja analgeticima (dani) Median (range)		2 (1-8)

iting 1 day after the procedure. The patient underwent 9 dental extractions and was prescribed an antibiotic.

Logistic regression analysis showed that age was associated with decreased risk for postoperative drowsiness (OR: 0.903; 0.95CI: 0.818-0.997; $p=0.044$) and increased risk for postoperative cough (OR: 1.278; 0.95CI: 1.022-1.599; $p=0.032$). Also, the diagnosis was significantly associated with drowsiness (OR:0.675; 0.95CI: 0.525-0.867; $p=0.002$). No other significant associations were found (Table 4).

Discussion

The results of our survey show that complications after dental treatment in GA occur frequently but are mild and short lasting, which is in concordance with other studies in the literature (8–12). Most frequent post discharge complications in our patients were drowsiness and pain, which were both reported in 40 (60.6%) patients. Drowsiness is very common after dental treatment in GA with prevalence be-

Logističkom regresijom pokazano je da je dob bila povezana sa smanjenim rizikom od ošamućenosti (OR : 0,903; 0,95CI : 0,818 – 0,997; $p = 0,044$) i povećanim rizikom od kašlja (OR : 1,278; 0,95CI : 1,022 – 1,599; $p = 0,032$). Dijagnoza je bila statistički značajno povezana s ošamućenošću (OR : 0,675; 0,95CI : 0,525 – 0,867; $p = 0,002$). Druge značajne povezanosti nisu pronađene (tablica 4.).

Rasprava

Rezultati našeg istraživanja pokazuju da se komplikacije poslije stomatološkog liječenja u OA događaju često, ali su blage i kratkotrajne, što je u skladu s ostalim studijama u literaturi (8 – 12). Najčešće komplikacije nakon otpusta u naših su pacijenata bile ošamućenost i bol – prijavilo ih je 40 pacijenata (60,6 %). Ošamućenost poslije stomatološkog liječenja u OA vrlo je česta, a prevalencija iznosi od 13 do 84 % (3,

Table 2 Frequency of postoperative complications
Tablica 2. Frekvencija postoperativnih komplikacija

Type of complication • Vrsta komplikacije N (%)	Yes • Da	No • Ne	Not sure • Nisam siguran	Missing • Nema odgovora	Diagnosis • Dijagnoza (p)	Previous dental treatment(s) in GA • Prijašnje liječenje u OA-u (p)	Dental Extractions • Ekstrakcija zuba (p)	Antibiotic Treatment • Antibiotsko liječenje (p)
Drowsiness • Ošamućenost	40 (60.6)	20 (30.3)	6 (9.1)	0	0.056	0.545	0.401	0.171
Agitation • Uznemirenost	23 (34.8)	38 (57.7)	3 (4.5)	2 (3)	0.258	0.893	0.516	0.088
Nausea • Mučnina	5 (7.6)	52 (78.8)	9 (13.6)	0	0.089	0.298	0.226	0.775
Vomiting • Povraćanje	1 (1.5)	65 (98.5)	0 (0)	0	0.694	0.506	0.618	0.276
Fever • Povišena temperatura	2 (3)	61 (92.4)	3 (4.5)	0	0.888	0.251	0.515	0.219
Cough • Kašalj	7 (10.6)	57 (86.4)	1 (1.5)	1 (1.5)	0.019*	0.052	0.706	0.346
Impaired sleep • Poremećaj sna	3 (4.5)	56 (84.8)	7 (10.6)	0	0.965	0.989	0.203	0.743
Sore throat • Grlobolja	10 (15.2)	43 (65.2)	13 (19.7)	0	0.114	0.999	0.166	0.413
Epistaxis • Epistaksa	3 (4.5)	61 (92.4)	2 (3)	0	0.034*	0.429	0.056	0.259
Pain • Bol	40 (60.6)	12 (18.2)	14 (21.2)	0	0.684	0.196	0.185	0.173
Swelling • Oteklina	15 (22.7)	48 (72.7)	3 (4.5)	0	0.750	0.265	0.320	0.449
Bleeding • Krvarenje	24 (36.4)	39 (59.1)	3 (4.5)	0	0.279	0.333	0.106	0.128
Difficulty eating • Otežano jedenje	38 (57.6)	23 (34.8)	5 (7.6)	0	0.409	0.880	0.021*	0.076
Inability to eat • Nemogućnost jedenja	11 (16.7)	49 (74.2)	6 (9.1)	0	0.970	0.963	0.227	0.701

*significant difference ($p < 0,05$) / značajna razlika ($p < 0,05$)

Table 3 Clinical characteristics of complications
Tablica 3. Kliničke karakteristike komplikacija

Occurrence of complication • Pojava komplikacije	N (%)
Day 0 • Dan 0	41 (61.9)
Day 1 • Dan 1	16 (23.8)
Day 2 • Dan 2	0
Day 3 • Dan 3	6 (9.5)
Day 4 • Dan 4	3 (4.8)
Duration Median (Range) • Trajanje Median (Raspon) 62 responses • 62 odgovora	2 (1-8)
Management • Liječenje 63 responses • 63 odgovora	
Conservative measures at home • Konzervativne mjere kod kuće	57 (90.5)
Conservative measures at home plus phone consultation with dentist or general practitioner • Konzervativne mjere kod kuće i telefonska konzultacija sa stomatologom ili liječnikom	5 (7.9)
Admission to the hospital • Prijam u bolnicu	1 (1.6)

Table 4 Impact of demographic and clinical factors on the occurrence of postoperative complications – results of the regression analysis
Tablica 4. Utjecaj demografskih i kliničkih čimbenika na pojavu postoperativnih komplikacija – rezultati regresijske analize

Type of Complication • Vrsta komplikacije	Age • Dob	Diagnosis • Dijagnoza	Dental Extractions • Ekstrakcije zuba	Antibiotic Treatment • Liječenje antibioticima
Odds ratio (CI) • Omjer rizika (CI) <i>p</i>				
Drowsiness • Ošamućenost	0.903 (0.818-0.997) 0.044*	0.675 (0.525-0.867) 0.002*	0.821 (0.637-1.059) <i>0.821</i>	3.899 (0.727-20.925) <i>0.112</i>
Agitation • Uznemirenost	0.967 (0.878-1.065) <i>0.496</i>	0.837 (0.667-1.049) <i>0.122</i>	1.079 (0.845-1.376) <i>0.542</i>	2.249 (0.563-8.976) <i>0.251</i>
Nausea • Mučnina	1.065 (0.959-1.183) <i>0.238</i>	0.689 (0.421-1.127) <i>0.138</i>	1.059 (0.811-1.383) <i>0.673</i>	0.880 (0.159-4.861) <i>0.884</i>
Vomiting • Povraćanje	0.749 (0.278-2.022) <i>0.569</i>	0.960 (0.291-3.171) <i>0.947</i>	1.064 (0.646-1.753) <i>0.807</i>	4926 (0.000 -) <i>0.998</i>
Fever • Povišena temperatura	0.974 (0.781-1.216) <i>0.816</i>	1.343 (0.855-2.108) <i>0.200</i>	1.436 (0.955-2.161) <i>0.082</i>	2.699 (0.129-56.431) <i>0.522</i>
Cough • Kašalj	1.278 (1.022-1.599) 0.032*	1.903 (0.918-3.495) <i>0.083</i>	0.273 (0.064-1.160) <i>0.079</i>	0.356 (0.018-7.022) <i>0.497</i>
Impaired sleep • Poremećaj sna	0.999 (0.884-1.128) <i>0.983</i>	1.110 (0.797-1.546) <i>0.536</i>	0.763 (0.454-1.282) <i>0.307</i>	4.720 (0.530-42.019) <i>0.164</i>
Pain • Bol	1.080 (0.938-1.243) <i>0.286</i>	0.939 (0.725-1.215) <i>0.631</i>	1.085 (0.822-1.433) <i>0.563</i>	0.315 (0.056-1.764) <i>0.189</i>
Swelling • Otekline	0.948 (0.850-1.056) <i>0.330</i>	1.091 (0.875 - 1.360) <i>0.440</i>	0.995 (0.797-1.242) <i>0.963</i>	2.246 (0.526-9.586) <i>0.274</i>
Bleeding • Krvarenje	0.984 (0.899-1.077) <i>0.726</i>	1.199 (0.966-1.489) <i>0.099</i>	1.214 (0.923-1.596) <i>0.166</i>	1.977 (0.491-7.960) <i>0.338</i>
Difficulty eating • Otežano jedenje	1.107 (0.986-1.243) <i>0.085</i>	1.064 (0.863-1.312) <i>0.562</i>	1.252 (0.932-1.681) <i>0.135</i>	0.792 (0.202-3.104) <i>0.737</i>
Inability to eat • Nemogućnost jedenja	1.036 (0.949-1.132) <i>0.431</i>	1.007 (0.809-1.252) <i>0.954</i>	1.117 (0.895-1.395) <i>0.328</i>	0.657 (0.162-2.659) <i>0.555</i>
Sore throat • Grlobolja	1.097 (1.000-1.204) <i>0.051</i>	0.951 (0.759-1.191) <i>0.661</i>	1.180 (0.938-1.484) <i>0.157</i>	0.449 (0.109-1.853) <i>0.268</i>
Epistaxis • Epistaksa	1.042 (0.891-1.219) <i>0.606</i>	1.190 (0.783-1.808) <i>0.416</i>	0.402 (0.117-1.382) <i>0.148</i>	0.814 (0.047-14.205) <i>0.888</i>

*significant difference ($p < 0,05$) / značajna razlika ($p < 0,05$)

tween 13-84% (3,10–12). The difference in reported prevalence could be due to different GA technique, medications, duration of the procedure, patient's age and diagnosis (12). In our patients, younger age was significantly associated with drowsiness (OR 0.903; CI 0.818-0.997; $p=0.044$), which is in concordance with study of Farsi et al. (3). Another commonly reported anesthesia-related complication was agitation which was found in 23 (34.8%) patients. Ersin et al. (10) reported agitation dropping from 58.1% immediately after the procedure to 24.4% at home on the day of the procedure. The assessment of drowsiness and agitation in young patients is not a simple task, especially if patients have associated intellectual or emotional impairment as majority of our patients (68.2%) did, hence these results need to be taken with caution. Other anesthesia-related complications such as nausea, vomiting, fever, sore throat, cough, epistaxis and impaired sleep were less common (1.5-15.2%) indicating that GA procedure performed in our setting was safe, with complication rates dissimilar to other studies.

High frequency of oral pain after treatment in GA is a common finding, occurring in 13-74% of the patients (3,11,12). High prevalence of postoperative pain is not

10 – 12). Razlika u prevalenciji može biti posljedica različite tehnike OA, lijekova, trajanja zahvata, dobi pacijenta i dijagnoze (12). Kad je riječ o našim pacijentima, mlađa dob bila je statistički značajno povezana s ošamućenošću (OR 0,903; CI 0,818 – 0,997; $p = 0.044$), što je u skladu s istraživanjem Farsija i suradnika (3). Druga često prijavljena komplikacija povezana s OA jest uznemirenost koju su prijavila 23 pacijenta (34,8 %). Ersin i suradnici (10) izvijestili su da učestalost uznemirenosti pada s 58,1 % odmah poslije zahvata na 24,4 % kod kuće na dan zahvata. Procjena ošamućenosti i uznemirenosti u slučaju mlađih pacijenata nije jednostavna, posebno ako imaju intelektualno ili emocionalno oštećenje kao što je bio slučaj s većinom naših pacijenata, tako da navedene rezultate treba tumačiti s oprezom. Druge komplikacije povezane s OA, poput mučnine, povraćanja, povišene temperature, grlobolje, kašlja, epistakse i poremećaja spavanja bile su znatno rjeđe (1,5 – 15,2 %), što govori u prilog tome da je stomatološko liječenje u OA provedeno u našoj ustanovi sigurno, s postotkom komplikacija koji se ne razlikuje od onih u drugim studijama.

Bol nakon stomatološkog zahvata u OA-u čest je nalaz i pojavljuje se kod 13 do 74 % pacijenata (3, 11, 12). Visoka

surprising since majority of these patients undergo extensive procedures in order to eliminate all existing dental pathologies. These procedures often include numerous extractions, due to high dental caries activity. Dental extractions were performed in great majority (53/80,3%) of our patients and the median number of extracted teeth was 2 (0-18). However, dental extractions were not associated with occurrence of oral pain. It is possible that pain was related to other procedures that inevitably included manipulation with soft oral tissues, which could have resulted in postoperative discomfort. One might question this finding since majority of our patients (44/66,7%) had some form of intellectual or emotional impairment and their ability to express their pain could have been affected. This could be the reason why one fifth (14/21,2%) of the parents/caregivers responded "I don't know" to a question about pain. However, we believe that the reported frequency of pain is realistic since another complication closely related to oral pain, i.e. difficulty eating, was reported in similar number of patients (38/57,6%). Even though difficulty eating was more frequently reported among patients who underwent dental extractions (34/64,2% vs. 4/30,8%), dental extractions were not found to be independent risk factor for the development of this complication in logistic regression model. We believe this was primarily due to small number of participants. Oral bleeding was reported in 24 (36,4%) patients which is a prevalence similar to other studies (3,10). However, we believe that in majority of the patients there was no serious bleeding that required medical intervention, but rather normal postoperative ooze that was mistaken for bleeding by parents/caregivers. This assumption is reinforced by the fact that none of the patients required professional assistance.

Even though post discharge complications were frequent, majority of them were managed by the parents/caregivers with conservative measures at home and only one patient (1,5%) was readmitted to hospital. The rate of unplanned admissions after a day care surgery is reported to be 1.8-3,5% (13,14). On the other hand, Verco et al. (6), reported only 22 cases (0,13%) of clinical incidents that required transfer to the hospital among 17 557 dental procedures in GA in a day-care unit performed in 5 years. The authors applied more strict exclusion criteria for GA in a day-care setting among other patients with quadriplegia. Therefore, our patient would not even be considered to be a candidate for dental procedure in GA in a day-care setting. We believe that the difference in readmission rates is primarily due to a significantly greater number of cases in the study of Verco et al. (6) and that with time, readmission rates in our service will drop.

This study has several limitations that need to be mentioned. This study is retrospective and the data are based on parents'/caregivers' recollection which might alter with time. However, we feel that dental treatment in GA presents a strong experience for patients as well as for parents/caregivers and that any significant complication would not be foreseen. This especially refers to complications requiring transfer to the hospital, which were the primary concern of our study. Another limitation is a relatively low number of participants. Even though the number is small, it represents near-

prevalencija boli ne iznenađuje zato što je većina tih pacijenata bila podvrgnuta opsežnim zahvatima kako bi se eliminirala sva postojeća odontogena patologija. Navedeni zahvati često uključuju mnogobrojne ekstrakcije zuba zbog visoke aktivnosti karijesa. Većini naših pacijenata (53/80,3 %) rađene su ekstrakcije zuba, a medijan ekstrahiranih zuba iznosio je 2 (0 – 18). Doduše, ekstrakcije zuba nisu bile povezane s boli. Moguće je da je bol bila povezana s drugim zahvatima koji su nužno uključivali manipulaciju mekim tkivima, što je moglo rezultirati postoperativnom nelagodnom. Taj se rezultat može propitivati jer je većina naših pacijenata (44/66,7 %) imala neki oblik intelektualnog ili emocionalnog oštećenja koje je moglo utjecati na njihovu sposobnost izražavanja boli. To može biti razlog zašto je jedna petina roditelja/skrbnika (14/21,2 %) na pitanje o boli odgovorila: „Ne znam“. Unatoč tomu vjerujemo da je prijavljena frekvencija boli realna jer je druga komplikacija blisko povezana s boli (otežano jedenje) prijavljena u sličnom postotku (38/57,6 % pacijenata). Iako je otežano jedenje češće prijavljeno za pacijente kojima su izvađeni zubi (34/64,2 % vs. 4/30,8 %), ekstrakcije nisu bile neovisni čimbenik rizika za razvoj te komplikacije u našem regresijskom modelu. Vjerujemo da je to uglavnom posljedica malog broja ispitanika. Krvarenje se pojavilo kod 24 pacijenta (36,4 %), što je postotak sličan onomu u ostalim studijama (3, 10). Mišljenja smo da kod većine pacijenata nije bilo ozbiljnog krvarenja koje je zahtijevalo medicinsku intervenciju, nego je bila riječ o normalnom postoperativnom curenju koje su roditelji/skrbnici pogrešno proglasili krvarenjem. U prilog tomu je i činjenica da ni jedan od pacijenata nije trebao profesionalnu pomoć.

Iako su komplikacije poslije otpusta bile česte, većinu su sanirali roditelji/skrbnici konzervativnim mjerama kod kuće i samo je jedan pacijent (1,5 %) ponovo primljen u bolnicu. Postotak neplaniranih hospitalizacija poslije zahvata u jednodnevnoj kirurgiji iznosi od 1,8 do 3,5 % (13, 14). Istaknimo da su Verco i suradnici (6) izvijestili o 22 slučaja (0,13 %) koji su zahtijevali prijam u bolnicu, na 17 557 stomatoloških zahvata u OA provedenih u sustavu jednodnevne kirurgije u petogodišnjem razdoblju. Autori su primjenjivali strože isključne kriterije za prijam pacijenata u jednodnevnu kirurgiju, među kojima i kvadriplegiju. Tako naš pacijent ne bi uopće bio kandidat za stomatološko liječenje u OA u sustavu jednodnevne kirurgije. Mišljenja smo da je razlika u postotku ponovnog primitka u bolnicu ponajprije posljedica značajno većeg broja zahvata u studiji Verca i suradnika (6) i da će se s vremenom postotak ponovnih hospitalizacija u našoj ustanovi smanjiti.

Ovo istraživanje ima ograničenja koja je potrebno spomenuti. Istraživanje je retrospektivno i podatci su temeljeni na prisjećanju roditelja/skrbnika koje se s vremenom može promijeniti. Ipak mislimo da je stomatološko liječenje u OA snažno iskustvo kako za pacijente tako i za roditelje/skrbnike, te da je značajne komplikacije teško predvidjeti. To se posebno odnosi na komplikacije koje bi zahtijevale prijam u bolnicu, što je bio primarni fokus našeg istraživanja. Drugo ograničenje je razmjerno malo ispitanika. Iako je broj mali, to je gotovo trećina naših slučajeva (30,5 %) i mislimo da rezultati mogu snažno upućivati na trendove u prevalenciji kompli-

ly one third of our cases (30.5%) and we feel that the results may strongly point to trends in the prevalence of post discharge complications among our patients. However, the results of logistic regression need to be interpreted with caution as we cannot completely exclude the impact of confounding factors.

In conclusion, post discharge complications of dental treatment in GA in a day-care service are common. In great majority of cases these complications are mild, hence they can be managed independently by parent/caregiver with conservative measures. The results of this study further support the fact that dental treatment in GA in a day-care service is a safe procedure that can be performed with acceptable risk in selected patients who do not respond to other behavior management techniques.

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Conflict of interest statement

The authors declare no conflict of interest

Ethics statement

The study was performed in accordance with the declaration of Helsinki and was approved by the Ethics Committee of the University Clinical Hospital Zagreb/University of Zagreb, School of Dental Medicine

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kacija poslije otpusta među našim pacijentima. Rezultati regresijske analize trebaju se, doduše, interpretirati sa zadržkom jer ne možemo potpuno eliminirati mogući utjecaj zbunjujućih čimbenika.

Zaključno, česte su komplikacije stomatološkog liječenja u OA provedenog u sustavu jednodnevne kirurgije koje se događaju nakon otpusta. U najvećem broju slučajeva one su blage i roditelji/skrbnici mogu ih samostalno liječiti konzervativnim mjerama. Nadalje, rezultati ovog istraživanja pokazuju da je stomatološko liječenje u OA, u sustavu jednodnevne kirurgije, siguran zahvat koji se može provesti uz prihvatljiv rizik kod odabranih pacijenata kod kojih druge tehnike modifikacije ponašanja ne funkcioniraju.

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Sukob interesa

Autori nisu bili u sukobu interesa.

Etička izjava

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Doprinos autora: V. B. – dizajnirao je studiju i pridonio prikupljanju, analizi i interpretaciji podataka te izradi zaključne verzije rada; B. J., D. G i D. V. J. – pridonijeli su dobivanju etičkoga odobrenja za studiju, prikupljanju i interpretaciji podataka; M. L. i V. S. – pridonijeli su kritičkoj analizi svih verzija rada; Ž. V. – pridonio je dizajnu i konceptu, prikupljanju, analizi i interpretaciji podataka, izradi i kritičkoj reviziji teksta, superviziji studije i izradi zaključne verzije rada

Sažetak

Svrha rada: Ispitati učestalost i liječenje komplikacija nakon otpusta pacijenata koji su bili podvrgnuti stomatološkom liječenju u općoj anesteziji (OA) u sustavu jednodnevne kirurgije i identificirati čimbenike koji povećavaju rizik od navedenih komplikacija. **Ispitanici i postupci:** Anonimni upitnik poslan je roditeljima/skrbnicima pacijenata koji su bili podvrgnuti stomatološkoj sanaciji u OA u našoj ustanovi između 1. siječnja 2017. i 31. srpnja 2019. Prikupljeni su demografski i klinički podatci o pacijentima te podatci o pojavi komplikacija i njihovu liječenju. **Rezultati:** Na upitnik je odgovorilo 66 roditelja/skrbnika (30,5 %). Najčešće komplikacije bile su ošamućenost i bol koje su se pojavile kod 40 pacijenata (60,6 %). Liječene su konzervativnim mjerama kod kuće u 57 slučajeva (91,9 %). Telefonska konzultacija sa stomatologom bila je potrebna u pet slučajeva (8,1 %). Jedan pacijent (1,6 %) bio je ponovo primljen u bolnicu. Mlađa dob i dijagnoza bile su povezane s povećanim rizikom od ošamućenosti. **Zaključak:** Komplikacije stomatološkog liječenja u općoj anesteziji poslije otpusta iz jednodnevne kirurgije su česte, no roditelji/skrbnici mogu ih u većini slučajeva liječiti konzervativnim mjerama kod kuće. Postotak ponovnih prijama u bolnicu je nizak. Stomatološko liječenje u OA u sustavu jednodnevne kirurgije siguran je zahvat koji se može obaviti uz prihvatljiv rizik ako se pacijenti pomno odaberu.

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