

A Survey of the Use of Perioperative Glucocorticoids in Oral and Maxillofacial Surgery



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Purpose: The aim of the study was to clarify the use of perioperative glucocorticoids (GCs) in association with oral and maxillofacial surgical procedures.

Materials and Methods: We conducted a survey of consultant oral and maxillofacial surgeons (OMSs) working in tertiary and secondary referral hospitals in Finland.

Results: The administration of GCs is common among OMSs (85.2% of respondents), especially in association with orthognathic surgery (100% of respondents) and facial fractures (43.5%). All OMSs who administered GCs reported that they reduce swelling. The next most common reasons for administering GCs were established practice (43.5%) and pain reduction (39.1%). The regimens differed widely from a 5-mg single dose to a 116-mg total dose of dexamethasone equivalent.

Conclusions: GCs are widely administered by OMSs, especially in major surgery. The literature shows some benefits of their use in dental and orthognathic operations, and their use seems rather safe. Proof of efficacy remains to be determined for other major maxillofacial surgical procedures; thus further studies are needed.

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Glucocorticoids (GCs) are involved in a wide variety of homeostatic, cardiovascular, metabolic, and immunologic actions. The natural GC cortisol is produced in the adrenal cortex and controlled by the hypothalamus and anterior pituitary gland. The synthetic GCs mimic the effects of cortisol, but have different biological half-lives and potencies.

GCs have been reported in the literature to be beneficial in reducing postoperative inflammatory symptoms in patients undergoing surgical removal of the third molar.¹⁻¹³ Studies also have shown that patients undergoing orthognathic surgery may benefit from GCs.^{14,15} However, the effect on surgical wound healing is contradictory.¹⁶⁻¹⁸ After surgery for orbital blowout fractures, GCs improve interpalpebral width.¹⁹ In reconstructive surgery, to our knowledge,

the evidence on GCs is nonexistent. Yet, because of their immunosuppressive effects, GCs are probably widely used in association with various types of surgical procedures in the facial region.

Assimes and Lessard²⁰ conducted a survey of North American members of the American Society of Maxillofacial Surgeons to clarify the prevalence of administration of GCs by surgeons performing cranio-maxillofacial or esthetic surgery. The survey showed that 46.7% of the respondents administer short-term high-dose GCs perioperatively. This finding reflects our experience that GCs also are used frequently in Finland, but it remains unclear why, when, and how they are used.

The aim of this study was to clarify the use of perioperative GCs in association with oral and maxillofacial surgical procedures. The specific aim was to design

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and implement a survey of Finnish consultant oral and maxillofacial surgeons (OMSs) working in secondary and tertiary referral hospitals to identify the prevalence of, and reasons for, administering GCs. The main hypothesis was that GCs are commonly administered to decrease postoperative swelling and pain.

Materials and Methods

All oral and maxillofacial consultants in 12 secondary and 5 tertiary referral hospitals in Finland were contacted by phone or in person and asked to respond to a standardized questionnaire about their policy for administration of short-term high-dose perioperative GCs. The inclusion criterion was that the respondent performs 1 or more of the surveyed surgical procedures on a regular basis. Of 34 consultants contacted, 27 (79.4%) responded to the questionnaire.

The key question was "Do you use short-term high-dose perioperative GCs in association with oral and maxillofacial surgery?" Use of GCs as a substitute for any medical condition was excluded.

The respondents who do not administer GCs were further asked to specify the reasons for not administering corticosteroids. The options were as follows: 1) the literature does not support the use of GCs, 2) there is an increased risk of complications, 3) GCs are not cost-effective, 4) GCs offer no benefits, and/or 5) other reason (with a request to elaborate).

The OMSs who administer GCs were further asked about their reason for use, among several options: 1) reduces swelling (airway compromise or general swelling caused by surgery was not further defined), 2) reduces pain, 3) reduces postanesthesia nausea, 4) improves operation outcome in general, 5) shortens hospitalization time, 6) shortens sick leave, 7) is an established practice of our department, and/or 8) other reason (with a request to elaborate). These OMSs also were asked to report any steroid-induced complications that they had encountered.

Finally, the steroid-administering consultants were asked about their frequency of GC administration in patients undergoing third molar surgery or dentoalveolar surgery, orthognathic surgery, surgery for facial fractures, and oncologic reconstructive surgery. The options were 1) always or very often, 2) about half of the cases, 3) seldom, or 4) I do not perform this kind of surgery. The participants also were asked to provide detailed information about their treatment regimens for each of the aforementioned procedures.

Results

Of the 27 respondents, 7 held double degrees (ie, MD and DDS) and all of them claimed they administer GCs. Years in practice did not seem to reflect the

policy regarding the administration of GCs, nor did the place of work (ie, tertiary or secondary referral hospital) (Table 1).

RESPONDENTS ADMINISTERING GCs

Of the 27 respondents, 23 (85.2%) claimed that they administer perioperative GCs. The reasons for GC administration were many. All 23 OMSs who administer GCs agreed that they reduce swelling. The additional reasons for GC administration were as follows: it is an established practice of the department (10 of 23 OMSs who administer GCs, 43.5%), it reduces pain (9 of 23, 39.1%), it shortens hospitalization time (7 of 23, 30.4%), it reduces postanesthesia nausea (4 of 23, 17.4%), and it shortens sick leave (1 of 23, 4.3%).

Of those respondents who perform orthognathic surgery actively, 100% claimed that they administer GCs, the respective figures for those who perform reconstructive surgery, facial fracture surgery, and third molar or dentoalveolar surgery being 50.0%, 43.5%, and 3.7%. Figure 1 shows the frequencies of GC administration in more detail, in association with different types of surgical procedures.

The steroid regimens differed greatly between the respondents in general and were particularly different between types of procedures. Overall, dexamethasone was the most frequently used GC, being administered by 13 respondents (60.9%). Hydrocortisone (6 respondents, 26.1%) and methylprednisolone (5 respondents, 21.7%) also were occasionally used.

Some respondents initiated treatment on the evening before surgery, whereas others initiated it during induction of anesthesia or intraoperatively. The course

Table 1. RESPONDENTS' BACKGROUND

	Respondents Who Do Not Administer Glucocorticoids (n = 4)	Respondents Who Administer Glucocorticoids (n = 23)
Experience		
6-10 yr	—	5
11-15 yr	1	5
15-20 yr	—	4
≥20 yr	3	9
Working hospital		
Secondary	1	11*
Tertiary	3	13*
Degrees		
Double (MD, DDS)	—	7
Single (DDS)	4	16

* One surgeon working in 2 hospitals.

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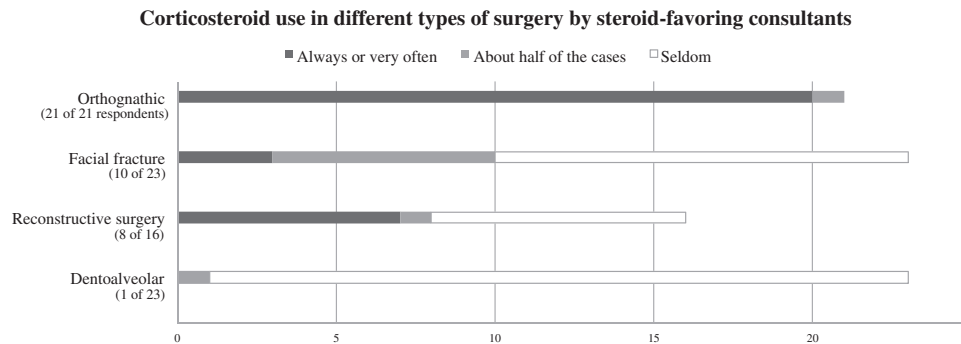


FIGURE 1. Corticosteroid use in different types of surgery by steroid-favoring consultants.

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length ranged from a single dose of GC to a perioperative course lasting up to 4 days postoperatively. Doses varied from a single dose of 5 mg to a total dose of 116 mg of dexamethasone equivalent. The total dose of GC in association with orthognathic surgery, facial trauma surgery, and reconstructive surgery was most often 10 to 40 mg of dexamethasone equivalent. Those OMSs preferring higher total doses preferred longer courses as well. Only 1 of the OMSs who administer GCs (4.3%) had encountered GC-related complications: these related to muscular pain in some patients who had been given the medication intramuscularly.

RESPONDENTS NOT ADMINISTERING GCS

Of the 4 respondents who claimed that they do not administer GCs, 2 were of the opinion that they are not cost-effective and the other 2 saw no benefits whatsoever in administering them.

Discussion

This study presents our survey results regarding the prevalence of, and reasons for, GC administration by Finnish consultant OMSs working in secondary and tertiary referral hospitals. The main hypothesis was that GCs are commonly administered to decrease postoperative swelling and pain.

An interesting finding was that 2 respondents claimed that the use of GCs is too costly, given that the price seems rather negligible (eg, US \$6.11 for dexamethasone, 5 mg intravenously). The results showed that the great majority of the respondents (85.2%) administer GCs. The main medical reasons for administering GCs were that they reduce postoperative swelling (claimed by 100% of the OMSs who administer GCs) and pain (39.1%). An established practice of one's department is considered a recommendation, but consultants are autonomous and may decide not to follow the policy of the hospital. However, because many consultants (43.5%) base their administration of GCs on this, it seems that, in many

hospitals, the use is recommended, and this is considered justified by the surgeons.

The use of GCs most likely stems from numerous studies supporting their use in third molar surgery.¹⁻¹³ Parallel to the respondents' reasoning for administering GCs, these studies also show reduced postoperative pain and edema. Interestingly, despite support by the literature, GC use was rare in Finnish third molar surgical procedures. The reason for this may be that third molar surgery is considered minor and procedures are mainly performed in outpatient departments with patients under local anesthesia only. In orthognathic surgery, on the other hand, GC use was a widely established practice; 100% of consultants performing orthognathic surgical procedures actively administer GCs.

Weber and Griffin¹⁴ randomly assigned a total of 23 patients undergoing orthognathic surgery to 1 of 3 groups, with all patients receiving 1 preoperative infusion and 3 postoperative infusions every 6 hours. Seven patients received placebo, eight received 16 mg of dexamethasone preoperatively and 3 doses of placebo postoperatively, and eight received 16 mg of dexamethasone preoperatively and three 8-mg doses postoperatively. The results showed that preoperative intravenous dexamethasone reduced postoperative inflammation and its associated edema significantly. Parallel results were observed by Scha-berg et al¹⁵ with the use of methylprednisolone. The policy of administering perioperative GCs in association with orthognathic surgery seems justified.

In our study, half of the respondents who perform reconstructive surgery, as well as 43.5% of those who treat facial fractures, claimed to administer GCs. Little has been published about the benefits of GCs in such procedures; however, the exception is the study by Flood et al¹⁹ that focused on orbital floor fractures. They randomly allocated 20 patients to receive methylprednisolone, 250 mg intravenously, at induction of anesthesia, followed by a further 3 doses at 6-hour intervals, or alternatively to receive placebo,

which was given with the same frequency. Patients who received GCs had a statistically significant increase in interpalpebral width. The authors concluded that courses of steroid therapy should be considered in orbital surgery for appropriate patients because of an advantage in being able to assess the globe postoperatively. It should be noted that in Finland, neurosurgeons are responsible for the treatment of skull base fractures and elevated intracranial pressure, and thus these conditions were not included in this query. In addition, ophthalmologists are often consulted regarding trauma to the eye adnexa and nerves, and the use of GCs may be directed by them.

Although most steroid-related complications occur after long-term use, severe complications also have been reported in association with short-term high-dose treatment. Fleming and Flood²¹ described steroid-induced psychosis in a 16-year-old previously healthy female patient who received a regimen of 250 mg of methylprednisolone intravenously at induction, followed by 3 further doses of 250 mg at 6-hour intervals, in association with orthognathic surgery. The influence on surgical wound healing is contradictory.¹⁶⁻¹⁸ Although none of the respondents in our study had encountered any severe complications, the potential adverse effects of steroids in general, and contraindications for their use in particular, clearly must be recognized. For further information about contraindications and systemic side effects, the reader is referred to the comprehensive literature review about perioperative corticosteroid use in dentoalveolar surgery by Alexander and Thronson.²²

The perioperative GC regimens used by the respondents in our study varied greatly. The variation is understandable because different types of procedures were included in the survey. In addition, no general recommendations exist. In general, the use of short-term GCs seems to be rather safe, and Finnish consultants had not encountered severe complications. However, several questions remain open: When should treatment be initiated? What should the single doses, dose frequencies, and total dose be? How long should the treatment last? Which regimens are effective but do not increase steroid-related complications?

The wide use of GCs in oral and maxillofacial surgery, as well as the variety of regimens used, indicates the need for further clinical studies on their effects, especially in major surgical procedures. In particular, the benefits of GC use in reconstructive and facial trauma surgery are yet to be studied.

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