



Efficacy of ultra-short single agent regimen antibiotic chemo-prophylaxis in reducing the risk of meningitis in patients undergoing endoscopic endonasal transsphenoidal surgery

Teresa Somma^a, Alberto Enrico Maraolo^{b,*}, Felice Esposito^c, Luigi Maria Cavallo^a, Grazia Tosone^b, Raffaele Orlando^b, Paolo Cappabianca^a

^a Department of Neurosciences, Reproductive and Odontostomatological Sciences, Division of Neurosurgery – Università degli Studi di Napoli Federico II, Via Sergio Pansini 5, 80131 Napoli, Italy

^b Department of Clinical Medicine and Surgery, Section of Infectious Diseases – Università degli Studi di Napoli Federico II, Via Sergio Pansini 5, 80131 Napoli, Italy

^c Department of Neurosciences, Division of Neurosurgery – Università degli Studi di Messina, Messina, Italy

ARTICLE INFO

Article history:

Received 6 August 2015

Received in revised form 6 October 2015

Accepted 7 October 2015

Available online 13 October 2015

Keywords:

Endoscopic endonasal transsphenoidal surgery
Meningitis infectious complications
Chemo-prophylaxis
1st generation cephalosporin
Macrolides

ABSTRACT

Objectives: The study aims to evaluate the incidence of infectious complications (namely meningitis) within 30 days after endoscopic endonasal transsphenoidal neurosurgery (EETS) in patients receiving an ultra-short peri-operative chemo-prophylaxis regimen with 2 doses of 1st generation cephalosporin or macrolide.

Patients and methods: We retrospectively analyzed the clinical records of 145 patients who received an ultra-short chemoprophylaxis with two doses of an antibiotic, given 30 min before and 8 h after EETS, over a 30-month time-frame. Ninety-seven patients (66.89%) received endovenous cefazolin, a 1st generation cephalosporin, administered at a dosage of 1000 mg, and 48 patients (33.10%) with an history of allergy to various agents, received endovenous clarithromycin at a dosage of 500 mg.

Results: No case of peri- and post-operative meningitis occurred in patients receiving the 2 doses of antibiotic. Only one patient (0.68%) developed cerebral fluid leakage on the 7th postoperative day, which required the switching to a broad-spectrum antibiotic prophylaxis for one week; this patient received the ultrashort prophylaxis with a macrolide. In addition, 7 patients (4.82%) developed minor infectious complications such as low-grade fever (3 cases, all of them receiving cefazolin), enlarged submandibular and cervical lymphnodes (3 cases, all of them receiving cefazolin), and upper and lower respiratory tract infection (1 case receiving clarithromycin). The cost of this prophylaxis regimen ranged from 7.76 Euro (cefazolin) to 39.54 Euro (clarithromycin).

Conclusions: This study suggested that an ultra-short single-antibiotic prophylaxis is a safe, cheap and effective regimen to prevent post-operative meningitis in patients undergoing EETS and who do not require lumbar drainage after surgery. In these patients also the rate of minor infective complications was acceptable when compared with the previous more expensive regimen based on 3rd generation cephalosporin plus aminoglycoside or alone, that could be suitable only for at-risk patients (e.g. smokers, cerebrospinal leak or Cushing's diseases).

© 2015 Elsevier B.V. All rights reserved.

1. Introduction

The endoscopic endonasal transsphenoidal surgery (EETS) represents the contemporary treatment for lesions in the sellar region [1–4] because of its several advantages such as versatility,

Abbreviations: EETS, endoscopic endonasal transsphenoidal neurosurgery; CSF, cerebrospinal fluid; b.i.d., bis in die; SSIs, surgical site infections.

* Corresponding author at: Università degli Studi di Napoli Federico II, Via Sergio Pansini, 5, 80131 Napoli, Italy.

E-mail address: albertomaraolo84@alice.it (A.E. Maraolo).

<http://dx.doi.org/10.1016/j.clineuro.2015.10.007>

0303-8467/© 2015 Elsevier B.V. All rights reserved.

minimal invasiveness, and lower morbidity and mortality rates [5–7]. Since the EETS has been classified as a clean-contaminated procedure, the antibiotic prophylaxis has been widely discussed in order to reduce and/or avoid the risk of infectious complications [8–11], mainly represented by meningitis and sinusitis occurring in 1.6% and 8% of cases, respectively [12].

The prevention of surgical site infections is an important public health concern; in 2006 the Surgical Care Improvement Project (SCIP), endorsed by the Center for Medicare and Medicaid Services and the Joint Commission on Accreditation of Healthcare Organizations in order to study methods and strategies of reducing surgical

Table 1

Clinical features of 145 patients undergoing EETS.

Male (n)	65
Female (n)	80
Average (years)	50.00
Range of age (years)	12–81
Macroadenomas	102
Microadenomas	34
Craniopharyngiomas	1
Hyperplasia hypophysis	1
Rathke Cleft's cysts	3
Arachnoid cysts	2
Others	2
Total of patients (n)	145

complications, adopted the timely administration of prophylactic antibiotics as one of the important quality measures.

Although the role of antimicrobial prophylaxis in neurosurgery has been extensively addressed [13,14] guidelines have not yet been developed for the pituitary surgery.

In order to fill the gap, we investigated the efficacy of an ultra-short single-agent chemoprophylaxis regimen to prevent the peri-operative meningitis in 145 patients who underwent EETS.

2. Patients and methods

During a 30-month time-frame, a total of 253 patients underwent a resection of pituitary lesions (Table 1) by the means of an EETS at the Division of Neurosurgery of the Federico II University of Naples (Italy). One-hundred and eight patients were excluded by the present study since they required a prolonged antibiotic prophylaxis (extended surgical procedures [54 patients], functional sinus surgery [23 patients], high risk conditions such as surgery for traumatic, spontaneous or iatrogenic cerebrospinal fluid leakage [14 patients] or hypophysitis/apoplexy [17 patients]). As a matter of facts, in such cases, patients are at higher risk of infective complications: the extended surgical approaches and the CSF leakage provide a more direct communication between the intradural/subarachnoid compartment and the nasal cavities, while other conditions such as the sinusitis can have an infective etiology and hypophysitis or apoplexy might be treated with high dose corticosteroids. Furthermore, patients with other potentially complicating conditions or diseases (such as heavy smokers, patients with recurrent respiratory disease, patients with diabetes or complicated Cushing's disease) who have a higher risk of infections and particularly of meningitis by Gram-negative bacteria, were excluded by this study, since, in such cases, we used a longer antibiotic regimen with different agents.

We retrospectively analyzed the clinical records of the remaining 145 patients (65 males and 80 females; mean age 50 years).

The most common lesion requiring a transsphenoidal operation was a macroadenoma (70.34%) followed by a microadenoma (23.4%). Overall, 145 operations of EETS were performed. The surgical site preparation included the prepping of the face with iodopovidone and the application in both nasal cavities of cottonoids soaked in a solution of 50:50 of iodopovidone and saline solution. The surgical procedure was performed using a standard endoscopic endonasal approach to sellar region, according to the technique previously described in the literature [6,7,15,16].

The operative procedures lasted between 55 and 134 min (average, 82 min) for microadenomas and between 67 and 163 min (average, 105 min) for macroadenomas and other sellar lesions.

All 145 patients received two doses of antibiotic as a peri-operative prophylaxis – the first 30 min before the surgical approach and the second dose 8 h later. Ninety-seven patients (66.89%) received intravenous cefazolin, a 1st generation

Table 2

The cost in Euro of antibiotic regimens administered in our 145 patient series.

	N. pts	Cost in Euro/each administration	Overall cost in Euro
Cefazolin 1 g	97	3.88	7.76
Clarithromycin 500 mg	48	19.77	39.54

cephalosporin, administered at a dosage of 1000 mg, and 48 patients (33.10%), who had an history of allergy to various agents, received intravenous clarithromycin at a dosage of 500 mg. The cost of this prophylaxis regimen ranged from 7.76 Euro (cefazolin) to 39.54 Euro (clarithromycin).

The patients were re-evaluated in the neurosurgery outpatient clinic 3 months and 12 months after the procedure.

In a previous study we performed before January 2011, 170 patients undergoing EETS received a different chemoprophylaxis regimen based on a 3rd generation cephalosporin alone or combined with aminoglycoside for a mean of 3 days, starting in the peri-operative period in most cases (85.29%); only 14.71% patients, who were smokers with history of recurrent respiratory infections, started prophylaxis 24–48 h before the EETS. Of these 170 patients, 160 (94.11%) received antibiotic prophylaxis with a 3rd-generation cephalosporin associated with an aminoglycoside (amikacine 500 mg b.i.d.): 145 patients (90.62%) were treated with ceftazidime (1 g b.i.d.) and 15 patients (9.38%) with ceftriaxone (1 g/daily). The remaining 10 patients were treated with ceftazidime alone (1 g b.i.d.). The cost of this chemoprophylaxis ranged from 22.50 to 33.34 Euro daily.

3. Results

No case of peri- and post-operative meningitis occurred in patients receiving the 2 ultra-short single agent prophylaxis. Only one patient (0.68%), who had received prophylaxis with macrolide, developed CSF on the 7th postoperative day that required repeated endoscopic endonasal fibrin glue injections in the sphenoid sinus cavity to enforce the osteo-dural reconstruction and the switching to a broad-spectrum antibiotics therapy (cefazolin 1000 mg plus vancomycin 500 mg, twice in a day) for one week. In addition, 7 patients (4.82%) developed minor infectious complications such as low-grade fever (3 cases, all of them receiving cefazolin), enlarged submandibular and cervical lymph nodes (3 cases, all of them receiving cefazolin), and upper and lower respiratory tract infection (1 case receiving clarithromycin). All these complications occurred during the 1st post-operative day and were resolved with the continuation of the therapy for 5 days.

No cases of infection by fungi or *Meningococcus* were observed, particularly in the patient with CSF leak who was at very high risk of infections.

As shown in Table 2, the cost of the chemoprophylaxis antibiotic regimen ranged from 7.76 Euro (cefazolin) to 39.54 Euro (clarithromycin).

In the previous cohort of patients treated with 3rd generation cephalosporin alone or combined with aminoglycoside for a 3 days period, one case (0.58%) of meningitis by *Staphylococcus epidermidis* and 3 cases (1.76%) of sphenoid sinusitis were reported [11].

The overall cost of this regimen was more expensive (from 66.60 to 100.02 Euro).

4. Discussion

According to the Centers for Disease Control (CDC), surgical site infections (SSIs) still represent a remarkable factor of patients' mortality and morbidity [17]. In the last years, in order to face this problem, the main role of perioperative antimicrobial prophylaxis

Download English Version:

<https://daneshyari.com/en/article/3039787>

Download Persian Version:

<https://daneshyari.com/article/3039787>

[Daneshyari.com](https://daneshyari.com)