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Headache and botulinum toxin

Published online: 20 July 2005

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Abstract The authors discuss clinical and international experience about botulinum toxins (BTX types A and B) in headache treatment. Data from literature suggest good results for the treatment of tension-type headache, migraine and chronic tension-type headache. In the present paper mechanisms of action and injection sites will also be discussed.

Key words Migraine • Tension type • Botulinum toxin

Introduction

Botulin toxin (BTX), types A and B, is approved for the treatment of a variety of disorders caused by muscle over-activity [1]. An analgesic effect of BTX was observed when treating movement disorders associated with pain; serendipitous findings of its efficacy in headache were observed when BTX was utilised to treat patients for facial wrinkles with concomitant migraine [2].

Mechanism of action

BTX has different therapeutic mechanisms of action in headache:

1. A direct effect at the neuromuscular junction, producing myorelaxation.
2. A direct antinociceptive effect on nerves in the face, head and neck [3].
3. An indirect effect through the reduction of the central sensitisation [4, 5].

Clinical experience

There are many published reports concerning efficacy and safety of BTX in headache with different levels of evidence (Table 1). BTX has shown varying degrees of efficacy in the treatment of rare head and neck pain (Table 2).

Concerning cluster headache and trigeminal neural-

Table 1 Published papers concerning primary headache and level of evidence

Author/year	Primary headache type	Patients, <i>n</i>	Level of evidence
Smuts J et al., 1999 [6]	Chronic tension-type headache	37	III
Binder et al., 2000 [7]	Migraine	77	III
Silberstein et al., 2000 [8]	Migraine	123	III
Barrientos and Chana, 2003 [9]	Migraine	30	IB
Kaup et al., 2003 [10]	Chronic tension-type headache	208	II
Blumenfeld A, 2003 [11]	Migraine tension-type headache	271	II
Guyuron et al., 2002 [12]	Migraine	29	III
Wheeler, 1998 [13]	Migraine plus tension-type headache	4	IV
Klapper et al., 2000 [14]	Migraine plus tension type headache	38	IB
Ondo et al., 2004 [15]	Chronic migraine, chronic tension-type headache	60	IB

Table 2 Facial and neck pain, BTX use, and level of evidence

Author/year	Type of pain	Patients, <i>n</i>	Level of evidence
Brin et al., 2003 [16]	Cervical dystonia	170	V
Laubis-Heremann et al., 2002 [17]	Cervical dystonia	31	II
Freund and Schwartz, 2000 [18]	Chronic neck pain	30	IV
Wheeler et al., 2001 [19]	Chronic neck pain	5	IV
Nixdorf et al., 2002 [20]	Temporo-mandibular disorders	15	III
Schnider et al., 2002 [21]	Cervicogenic headache	33	II

gia, no controlled trials are available, although clinical reports are published.

Patients and methods

The authors have been utilising BTX type A and type B for headache since 1995. Patients were selected if they had headache resistant to conventional pharmacological medications.

Three injection techniques were used:

1. fixed points;
2. "follow the pain";
3. combination of both.

The procedures were followed by a muscle stretching programme. Forty-one patients were submitted to repetition of procedure. Patients were checked 2 and 4 months after the procedure. Investigators, using a retrospective chart review, evaluated the number of headache attacks per month, headache intensity and drug consumption. Questions about quality of life were asked.

Results

To date 390 patients have been treated. They were 155

men and 235 women, with a mean age of 48 years (range 18–65 years). Patients suffered from:

- a. chronic tension-type headache (296 patients, 75.9%);
- b. chronic migraine (39 patients, 10%);
- c. daily headache with drug abuse (47 patients, 12%);
- d. other rare subtypes of headache (8 patients, 2%).

BTX type A was utilised in 374 patients (95.9%). The mean dosage of BTX type A was 80 IU (range 50–100 IU) for BOTOX or equivalent doses of other type of BTX.

Using a retrospective chart the number of headache attacks per months, headache intensity and drug consumption were recorded. Headache attacks per month were reduced in 82% of patients. Eighty-five percent of patients reported lower intensity of pain, 78% reduced drug intake. These data are comparable to data published by Blumenfeld [11]. No major side effects were reported. Only four patients displayed mild and transient ptosis. Ten patients complained of mild muscle weakness in the neck.

Discussion and conclusions

The inadequacy of current preventive treatment for disabling primary headache makes new treatments, such as

BTX, an option. Preliminary clinical data are interesting, however more detailed studies are needed to validate the procedure. Selection of patients is essential, and technical

aspects are relevant. From the point of view of pharmacoeconomics too, BTX treatment seems to be worth considering [22, 23].

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