

# The Effects of Intramuscular Botulinum Toxin Injections on Hemiplegic Shoulder Pain

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**Introduction:** Hemiplegic shoulder pain (HSP) is one of the most common complications seen in hemiplegia, occurring in 20% to 70% of stroke patients.<sup>1</sup> It not only interferes with the rehabilitation process but also affects patients' quality of life. Although the etiology of HSP remains unknown, it can be due to many factors, such as subluxation of the humeral head, spasticity of surrounding muscles, complex regional pain syndrome, and adhesive capsulitis.<sup>2,3</sup> Recently, intramuscular botulinum toxin type A (BoNT-A) injection has been widely used for the management of spasticity and chronic pain. The aim of this study was to evaluate shoulder pain in patients who received BoNT-A injections to surrounding shoulder muscles for HSP.

**Material-Methods:** Seventy-six hemiplegic patients who applied to spasticity outpatient clinic between May 2018 and July 2018 were evaluated for HSP. BoNT-A was injected to pectoralis major and deltoid anterior muscles, using ultrasound guidance. The severity of pain was evaluated before and 1 month after the injections, using the Visual Analog Scale (VAS). Patients' global rating scale was evaluated with 5 point Likert scale (0: no change, 4: improvement clearly exceeding the defined therapeutic goal). Descriptive statistics (median, mean, and mode) and nonparametric Wilcoxon test were used.

**Results:** Twelve (15.7%) of the 76 patients were having HSP (7 male, 5 female), with a mean age of  $58.7 \pm 13.6$  years. The mean time since stroke occurrence was 5.4 years. The median VAS before injection was 6 and 1 month after injection was 3. There was a statistically significance difference ( $P=0.003$ ) in VAS values before and 1 month after injection. The median Likert scale was 2. Patients' satisfaction of the treatment was moderate.

Patients	Sex	Age (years)	hemiplegic side	disease duration (years)	VAS before	VAS later	Likert scale
1	Female	50	left	11	6	2	4
2	Male	53	left	0,5	8	3	3
3	Male	60	right	0,5	5	0	5
4	Female	67	left	5	5	5	0
5	Female	52	right	3	6	3	2
6	Male	34	left	2	6	3	2
7	Female	69	right	8	6	3	2
8	Male	80	left	8	2	0	0
9	Male	42	right	1	6	3	2
10	Male	67	left	11	8	3	3
11	Male	55	left	5	7	0	5
12	Female	75	left	10	4	2	1

Table: Demographic characteristics, pain intensity and global rating scale of the patients.

**Conclusions:** According to the results of this study, we suggest that BoNT-A injection to the surrounding muscles is a useful tool for pain reduction in the management of HSP. This may be due to the muscle-relaxant effect and the inhibition of neurotransmitter release by BoNT-A. Patients satisfaction of the injections was moderate. Patients' goal of the treatment may be complete pain relief. The therapeutic goals should be discussed between the patients and health care professionals.

## References

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