

# Flu-like and Systemic Symptoms Following Treatment with Botulinum Toxins

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## INTRODUCTION

Botulinum toxins have caused a revolution in several areas of neurology. Therapy with different botulinum toxin preparations is associated with benefit in dystonia, spasticity, autonomic dysfunction and other disorders. Local side effects of these have been reported in several publications; however systemic side effects have received relative little attention.

## BACKGROUND

Systemic and flu-like symptoms (FLS) symptoms are well recognized complications of treatment with different preparations of botulinum toxin (BoNT) for dystonia, spasticity and other disorders. However the frequency and correlations of these symptoms have not been well characterized. FLS have been reported in between 1.7 and 20% of patients treated with BoNT type A; and in 5 to 55% of cases of patients treated with BoNT type B [Baizabal-Carvallo JF, Jankovic J, Pappert E. *Toxicon* 2011; 58(1):1-7].

Clinically available BoNT preparations contain a variety of proteins, including hemagglutinins, which may be responsible for the FLS and other systemic symptoms occasionally associated with BoNT treatments.

## OBJECTIVE AND METHODS

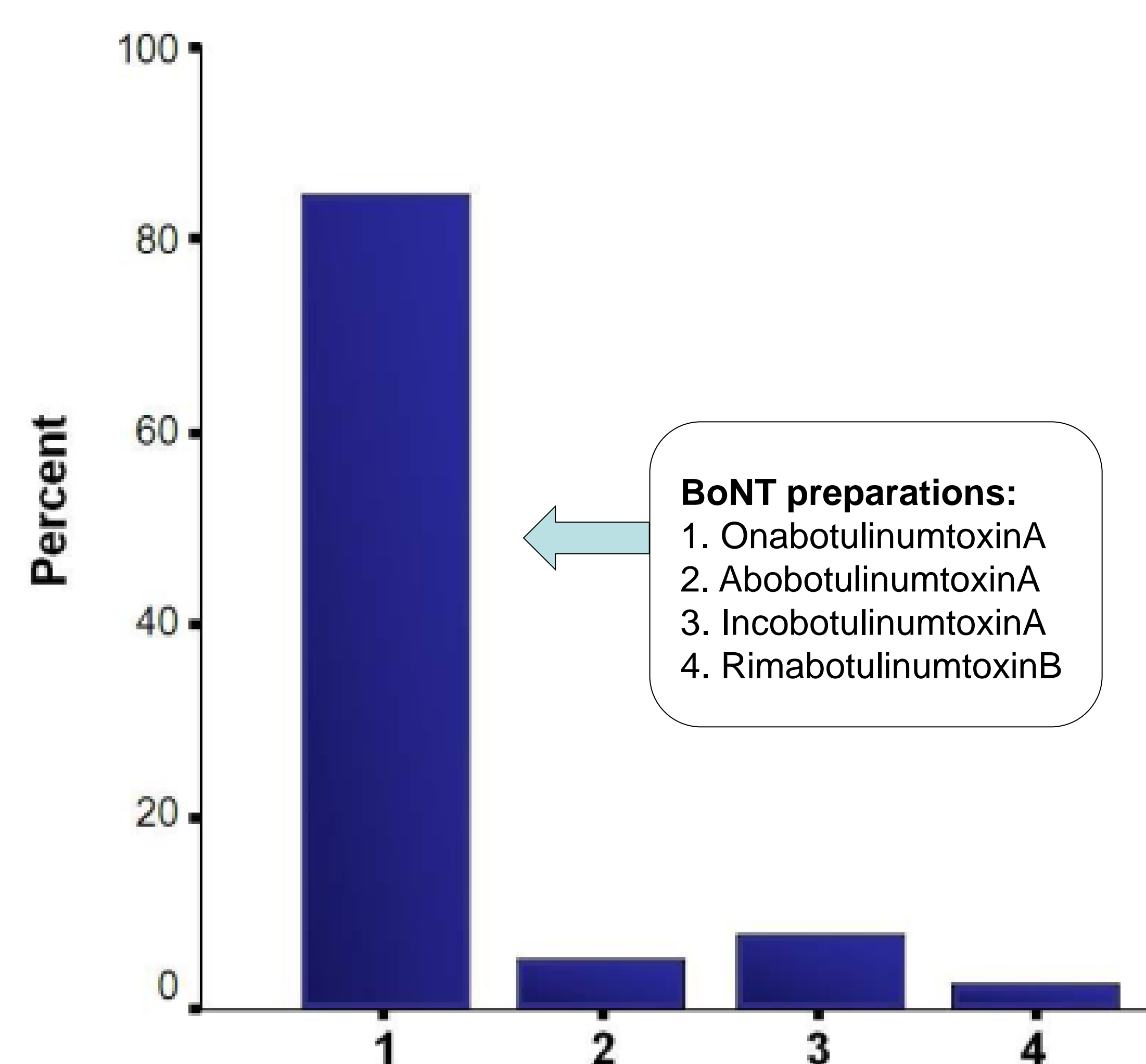
We aimed to assess the frequency and correlations of these symptoms interviewing consecutive patients seen in a movement disorders clinic. The interview was designed to address symptoms temporally related to BoNT injections and excluded other causes that may explain the symptoms.

We aimed to assess the frequency and characteristics of systemic symptoms and FLS in consecutive patients undergoing treatment with different presentations of botulinum toxin (BoNT) for different types of dystonia.

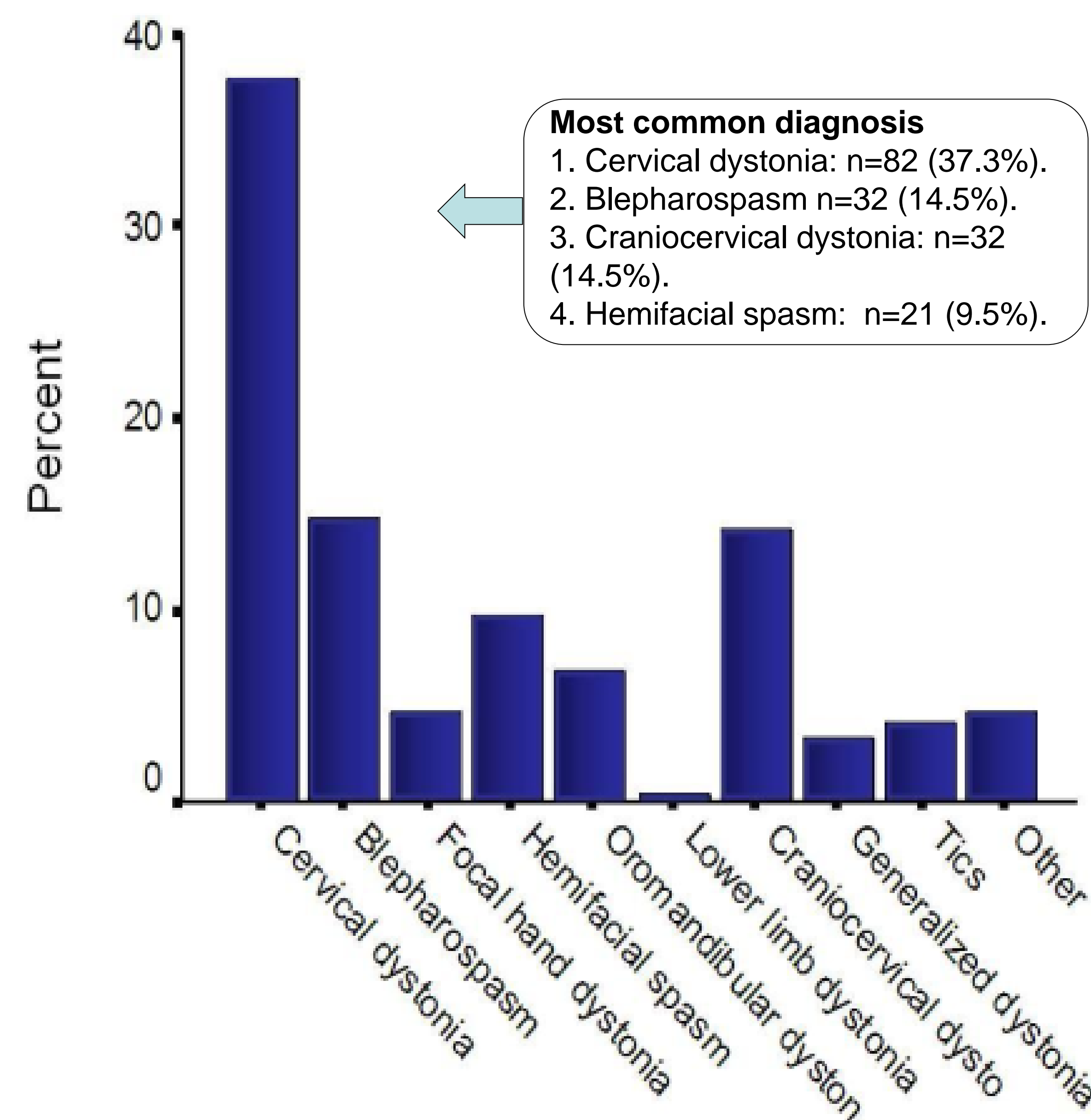
## RESULTS

A total of 218 patients on treatment with BoNT for at least one year were interviewed for FLS and other systemic side effects occurring within the first 10 days following previous BoNT injection.

There were 158 (72.5 %) women and 60 (27.5 %) men; mean age 61.2 ± 13.3 years; Most patients were receiving BoNT type A: n=212 (97.2%), and only a minority were on BoNT type B: n=6 (2.8 %).



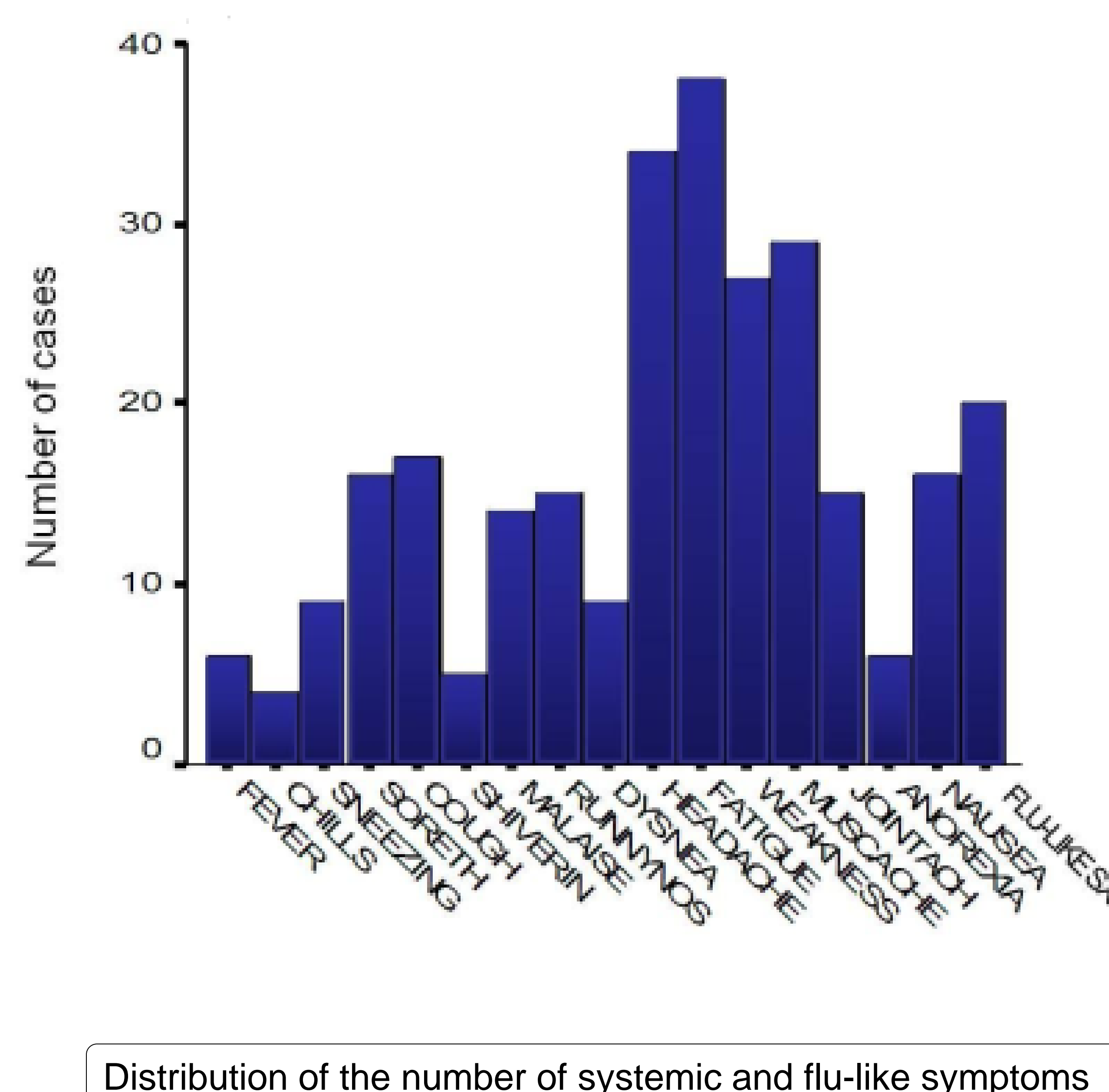
## RESULTS (continued...)



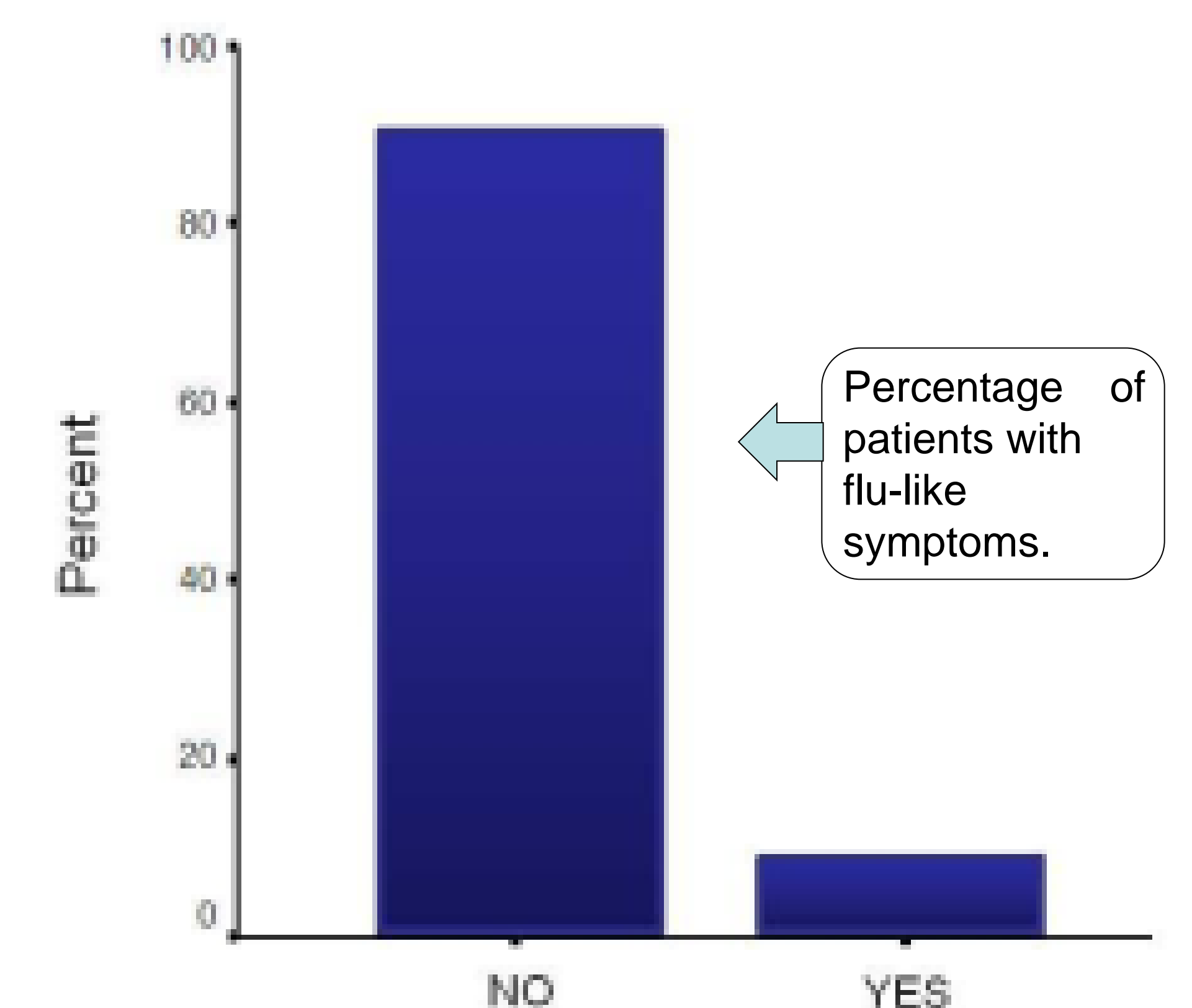
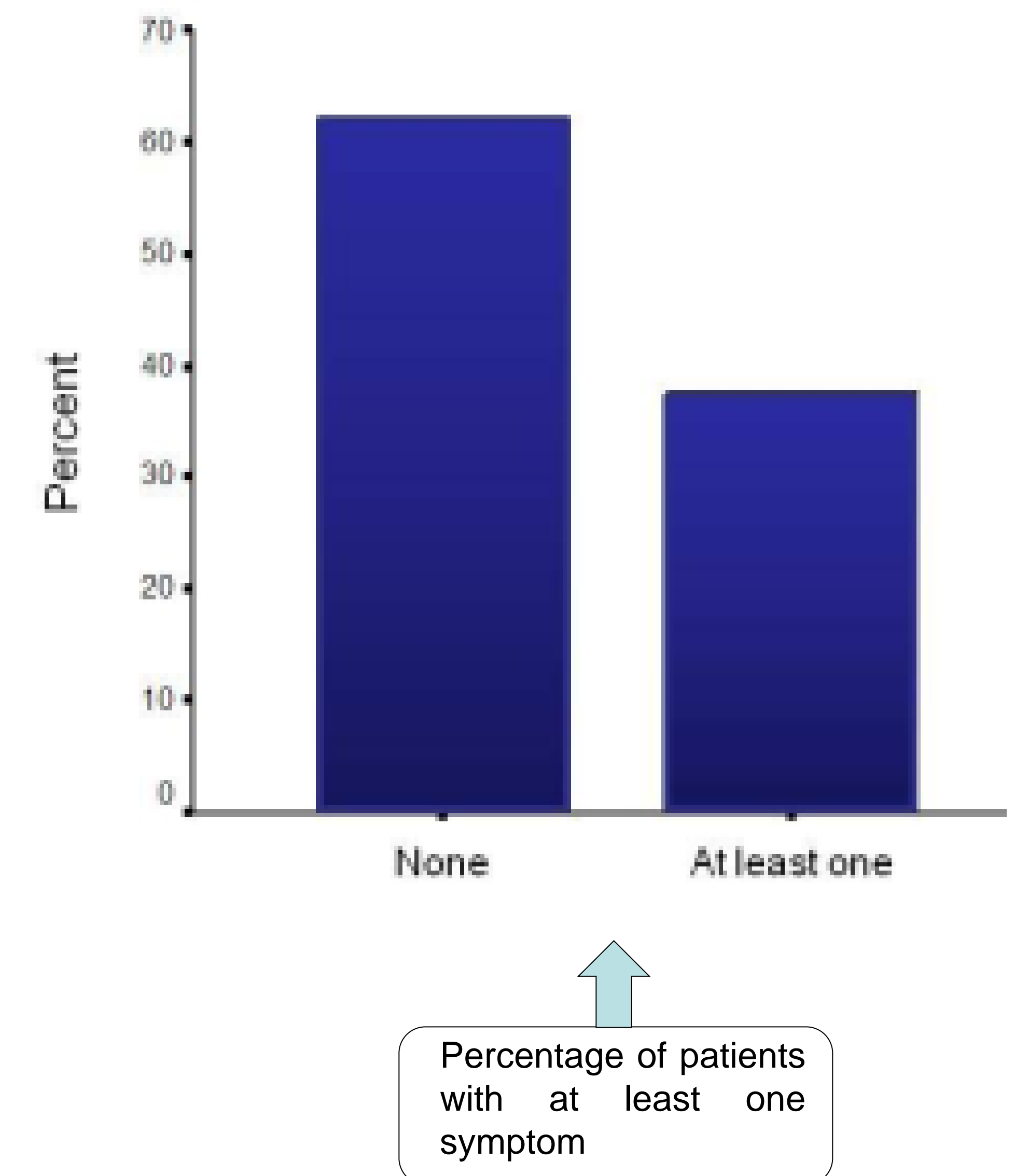
The most frequently reported symptoms were: generalized fatigue: n=38 (17.4%); headache: n=34 (15.6%); muscle aches: n=29 (13.3%); and generalized weakness: n=27 (12.4%). FLS symptoms were reported by 20 patients (9.2%); and at least one symptom was reported by 82 patients (37.6%).

Some symptoms were more frequently reported by women compared to men, including: headache (P=0.008); fatigue (P= 0.029); nausea (P= 0.010); and FLS (P=0.066). No differences in age, type of BoNT, dosage of BoNT, and underlying diagnosis were observed among patients with and without other symptoms.

Twenty six patients (11.9%) took over the counter medications to control the symptoms; 7.8% reported interference with activities of daily living; and 3.7% consulted a physician because any of the symptoms.



## RESULTS (continued...)



## CONCLUSION

FLS were reported by 9.2% patients receiving BoNT and more than a third reported more than one systemic complaint following BoNT treatment. None of these symptoms was reported as severe and most of them subsided within one week.

Women seem to have a higher risk to develop systemic side effects than men, following BoNT therapy. In a second part of the study, a prospective follow-up along with serological inflammatory markers (cytokines) are being collected to better understand the potential risk factors and mechanisms of these systemic BoNT-related side effects.

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