Objective: To assess the efficacy of a visual biofeedback treatment in patients with cervical dystonia (CD).

Background: CD is the most prevalent type of dystonia and many patients face a lifetime of chronic disability despite repetitive Botulinum toxin (BTX) injections. CD is associated with defective retrieval of specific motor programs in response to sensory stimuli. Several studies have shown disturbances of vestibular function and perception of body orientation, such as VOR asymmetry, vestibular hyperreactivity, difficulty recognizing postural and visual vertical and abnormal responses to neck muscle vibration. Therefore, CD patients have a greater reliance on vision for head control and maintaining postural stability. We used a portable head-lamp based device to synchronize gaze and head movements and to provide a visual feedback of head position to enhance central sensorimotor integration processes in CD.

Methods:
18 patients with primary CD (mean age 55 years, mean disease duration 7 years) with tonic and/or phasic CD were included and assessed baseline (minimum 12 weeks post BTX) and after six weeks of regular visual feedback training (minimum three training sessions / week). Severity of CD was assessed by Tsui scale, quality of life by CDQ-24 and neck pain by a visual analogue scale [VAS 0-10]. EMG-activity was assessed during spontaneous head position with bilateral surface electrode recordings of sternocleidomastoid, splenius capitis and trapezius muscles for 30s.

Results: At six-week follow up, the Tsui-score was significantly reduced from mean 12 (at baseline) to mean 5 points, the CDQ-24 improved significantly (p<0.01) and pain as measured by VAS was also significantly reduced from mean 6.0 to mean 3 points (p<0.05).

Conclusion: Visual biofeedback treatment improves quality of life in cervical dystonia by reducing dystonic posture and neck pain. Further studies in larger series are needed to assess long-term practicability and efficacy and to identify whether the efficacy of visual biofeedback varies among certain subtypes of CD (e.g. tonic vs. phasic CD, presence or absence of neck pain).