

# Heroin and strabismus

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## Summary

**Questions under study:** We report on a series of patients with acute strabismus related to heroin and methadone intake or withdrawal, discuss possible mechanisms involved in this clinical picture and make recommendations for work-up and referral.

**Methods:** Retrospective study.

**Results:** Five patients presented with acute esotropia within days of heroin withdrawal, and two patients developed exotropia related to heroin or methadone intake. Neurological work-up and neuroimaging was non-contributory in all four patients who were examined.

**Conclusion:** Acute esotropia with double vision is a disturbing side effect of heroin withdrawal, and, similarly, acute exotropia may be related to heroin intake. In the absence of focal neurological signs, further work-up is not mandatory. Referral to a specialised orthoptic service is beneficial in offering the patient symptomatic treatment and reassurance, thus supporting successful withdrawal therapy.

**Key words:** acute strabismus; diplopia; heroin abuse; heroin withdrawal; methadone

## Introduction

Diplopia in association with heroin intake and withdrawal has scarcely been described in the medical literature although it is apparently known to and sometimes feared by heroin users and their carers. The ophthalmological literature contains

only one report describing this association [1]. In addition, some cases of internuclear ophthalmoplegia related to narcotics have been reported [2–5].

## Participants and methods

Between 1993 and 2001 seven patients with acute strabismus related to heroin and/or methadone abuse were seen at the Strabismus Unit, Department of Ophthalmology, University Hospital Zurich, Switzerland. All seven

patients underwent ophthalmological and orthoptic examination and four patients were examined neurologically with incorporated neuroimaging.

## Results

Five patients developed acute esotropia (convergent squint) within days of heroin withdrawal, and two (Nos. 5 and 7) developed exotropia (divergent squint) related to heroin or methadone intake. Two patients (Nos. 4 and 5) had evidence of pre-existing strabismus. Neurological work-up and neuroimaging was non-contributory in all four patients examined. In three patients (Nos. 3, 5 and

7) neuroimaging was withheld because of the very suggestive temporal relationship as well as the absence of other neurological findings. Symptoms resolved either on resumption of heroin abuse, spontaneously during follow-up, or on symptomatic treatment with prisms. The relevant clinical data are summarised in Table 1.

**Table 1**

Clinical data on seven patients with acute strabismus related to heroin abuse. ET = esotropia, XT = exotropia.

Case	sex, age	onset of strabismus	type of strabismus	work-up	history / follow-up
1	male, 22	during 3-month heroin withdrawal treatment	small angle right ET in right- and downgaze (DD: rt. 6th nerve paresis)	normal neurological findings, normal brain MRI	history of double vision for three months / unchanged after one month
2	female, 23	on day 3 of pharmacologically unassisted heroin withdrawal	large angle right comitant ET for distance and near	normal neurological findings, normal brain CT	episode of diplopia during withdrawal 10 months ago/ resolution at 5 months
3	female, 32	on day 3 of pharmacologically unassisted withdrawal therapy	right comitant ET with varying angles		spontaneous remission after two weeks
4	male, 25	on day 2 of pharmacologically unassisted heroin withdrawal	left comitant ET (decompensated microstrabismus)	normal neurological findings, normal brain MRI	complete remission of diplopia after restarting drug abuse one month later
5	female, 24	minutes after intake of opioids (heroin and methadone)	right consecutive XT dependent on intake of opioids		history of strabismus surgery at age 2 for congenital ET/ constant exotropia during opioid abuse
6	male, 31	on day 4 of heroin and cocaine withdrawal (in prison)	left comitant ET for distance (DD: bilat. 6th nerve paresis)	normal neurological findings, normal brain MRI	marked improvement after 12 days, no further follow-up
7	female, 31	hours after single heroin intake i.v. after remaining "clean" for one year	alternating XT with horizontal diplopia		resolution of diplopia within four days, residual small exophoria for near

## Discussion

Both heroin intake and withdrawal have a dramatic impact on the human central nervous system's function. It is not surprising, therefore, that the delicate balance between the oculomotor system and the sensory mechanisms of binocular vision may be influenced by sudden changes in blood opioid levels. One previous report [1], a personal communication (L. Kowal and J. Mee, Melbourne), and our present study prompted the conclusion that the most common oculomotor abnormality in connection with opioid abuse is acute comitant esotropia on drug withdrawal. In hyperopic subjects, the sudden parasympatholytic state with pupillary dilation and paralysis of the ciliary muscle may play a role in precipitating decompensation of an accommodative esotropia. In two patients a subtle 6<sup>th</sup> nerve paresis or divergence insufficiency type of squint could not be ruled out. Interestingly, our two cases of exotropia were both related to heroin or methadone intake rather than withdrawal. Poor binocular function prior to heroin abuse seems to be a predisposing factor for development of the condition described.

Acute esotropia with double vision is a disturbing side effect of heroin withdrawal, and, similarly, acute exotropia may be related to heroin intake. In the absence of focal neurological signs, further work-up is not mandatory. Primary care physicians should be aware of the relationship between acute strabismus and heroin withdrawal, since referral to a specialised service is beneficial in offering the patient symptomatic treatment and reassurance, thus supporting successful withdrawal therapy.

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