**Summary**

Over the last few years, injecting drug users in Australia increasingly injected the contents of temazepam gelcaps, an activity associated with significant harm. Although changes to the Pharmaceutical Benefits Scheme in May 2002 reduced the prescription of gelcaps, they did not eliminate misuse. Temazepam capsules were withdrawn from the Australian market in March 2004. Already front-line services are reporting a decrease in harm and misuse.

Key words: adverse effects, drug dependence, benzodiazepines, hypnotics.

**Introduction**

Until recently, temazepam was available in Australia as a tablet and as a soft gelatin capsule (gelcaps). There is little evidence that there was any clinical reason to prescribe gelcaps instead of tablets.1 There was evidence of an increase in intentional misuse, abuse, dependency and complications related to the injection of the liquid contents of temazepam gelcaps.

**Research evidence**

The intravenous misuse of temazepam was first reported in Scotland in 1987.2 International research has shown that temazepam, flunitrazepam and diazepam are the preferred benzodiazepines among injecting drug users. The practice of injecting benzodiazepines, and in particular the contents of temazepam gelcaps, is potentially very harmful and is a significant health issue for injecting drug users.3,4

Studies undertaken in Sydney found that benzodiazepines were commonly injected by people who also injected amphetamines or heroin, with diazepam and temazepam being the most likely to be injected.5 Another study in Southwest Sydney found 25% of injecting drug users had injected benzodiazepines at some time and that temazepam was the most commonly injected.6 A study in 2002 in Sydney found that while levels of methadone injection had fallen, there had been no decline in the proportion of injecting drug users injecting benzodiazepines.7 In the Kings Cross area of Sydney, there were anecdotal reports of an increasing problem with the injection of temazepam gelcaps and its associated harms since the heroin shortage in early 2001.8

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**Physical complications associated with the injection of temazepam gelcaps (Table 1)**

Temazepam is insoluble in water and there is evidence that it directly damages vascular epithelium. This means that both the gelcap and tablet formulations are harmful when injected. Gelcaps were preferentially injected because injecting drug users felt that they worked better than tablets and the contents were in a readily injectable form. They heated the capsules and then drew the contents up into a syringe.

A survey of users of multiple drugs in the Kings Cross area who injected temazepam gelcaps found that the majority injected up to 200 mg daily. The gelcaps were obtained from doctors and on the street. The users injected gelcaps to replace or enhance the effects of heroin, to offset effects of psychostimulants such as cocaine or methamphetamine, to deal with stress or psychological distress and/or to sleep. They injected because the effect was quicker and more intoxicating.

All those surveyed were aware of the risks of injecting. Most had suffered some complications in the past including abscesses, cellulitis, skin ulcers, nerve damage and distal limb amputation. A number reported using deep veins in the groin and neck because they could no longer access peripheral veins.

**Physical complications associated with the injection of temazepam gelcaps**

- thrombophlebitis
- compromised venous return leading to lymphoedema
- tissue inflammation
- abscesses
- ulcers
- cellulitis

These problems can lead to injecting in the groin and neck, resulting in:

- deep venous thrombosis
- large vessel stenosis
- pseudoaneurysm with high risk of massive haemorrhage

Intra-arterial injection can cause additional problems:

- distal limb ischaemia
- gangrene
- compartment syndrome
- rhabdomyolysis
- renal failure
However, in Kings Cross this did not result in a reduction in 10 mg temazepam gelcaps to require an authority prescription. Pharmaceutical Benefits Advisory Committee rescheduled in mid-2002, in response to the concerns over misuse, the misuse of gelcaps and a consequent significant health benefit.

In March 2004, Sigma withdrew its temazepam capsule in February 2004, however this made little difference to the use and availability of the more popular brands of temazepam.

In March 2004, Sigma withdrew its capsules from the市场. This has completely removed the gelcap formulation from Australia and as a consequence will have positive benefits for injecting drug users. Although temazepam capsules have been withdrawn, doctors need to be careful when prescribing benzodiazepines or other drugs of dependence. They need strategies to help them refuse demands for a prescription (see box).

**Conclusion**

The harmful effects of injecting the contents of temazepam gelcaps led to the withdrawal of this product from the Australian market. Doctors still ought to be vigilant to detect harm associated with the misuse of benzodiazepines and carefully consider the need to prescribe drugs with a risk of dependence, particularly to anyone who could be an injecting drug user or be in contact with injecting drug users.

**References**


**Conflict of interest:** none declared