

BRIEF COMMUNICATION

Poppy seed tea and opiate abuse in New Zealand

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Abstract

The opium poppy *Papaver somniferum* contains an array of opiates. There is a variety of methods of preparation that can be used by people with opiate dependence, with patterns of use determined by numerous factors including cost, safety, potency and legal status. The objective of this study was to determine the frequency and nature of poppy seed tea (PST) use by opiate-dependent patients in the form of a written questionnaire. The study took place at the Community Alcohol and Drug Clinic, Wellington, New Zealand, and comprised 24 opiate-dependent patients attending the clinic. A total of 11 of 24 (46%) patients reported having used PST. In five patients currently using PST it represented the major source of opiates, and two had managed to withdraw from use of other opiates with regular PST use. Patients reported a median onset of action of 15 minutes and an effect lasting a median of 24 hours. The major limitation of PST use was the foul taste. PST is used commonly by opiate-dependent patients attending an alcohol and drug clinic in New Zealand. The use of PST as the major source of opiates could be considered favourably within 'harm reduction' philosophies, because of its low cost, legal availability and oral route of administration. Conversely, there is the potential for PST to act as a 'gateway drug' by inducing opioid dependence and introducing people to the culture of drug abuse. [Braye K, Harwood T, Inder R, Beasley R, Robinson G. Poppy seed tea and opiate abuse in New Zealand. *Drug Alcohol Rev* 2007;26:215–219]

Key words: abuse, dependence, opiates, *Papaver somniferum*, poppy seed tea.

Introduction

Following the breakdown of major drug rings during the 1980s, the supply of imported heroin in New Zealand has been limited. As a consequence, opioid users have turned to more readily available pharmaceutical sources, notably morphine obtained from long-acting morphine tablets and codeine-containing analgesics ('homebake') [1]. Another source of opiates is from 'poppy seed tea' (PST), made by washing or soaking commercially available poppy seeds in water. Opium is found within the seed capsule of the opium poppy and comprises a variable mixture of alkaloids,

including approximately 10% morphine, 6% noscarpine, 1% papaverine, 0.5% codeine and 0.2% thebaine [2–4]. Dried poppy seeds are readily available, being a common baking ingredient stocked by many supermarkets and bulk food outlets. The seeds are best known for their opium content because of the role they have in causing false positive urine opiate tests in workplace drug testing [5,6], as well as Olympic and other sports drug-testing [7].

In New Zealand there is an emerging practice of opioid users washing or soaking large quantities of dried poppy seeds in order to remove opiates from the

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residual coating and capsular debris, which is then ingested orally. By this means, a variable but significant amount of morphine, codeine and other opiate alkaloids is able to be extracted and consumed. This method is similar to 'poppy tea', made from poppy heads boiled in water, as used by farm labourers in East Anglia in the 19th century as a remedy for a host of ailments and to soothe irritable infants [8].

This communication was prompted by an increasing number of patients presenting to Capital and Coast Health's Alcohol and Drug Service identifying PST as a major component in their current pattern of opiate use. We report the characteristics of PST users, their pattern of use, the amount of opiates contained in PST and discuss the public health implications.

Methods

Written questionnaires were administered to consecutive patients with opiate dependency referred to Capital and Coast Health's Alcohol and Drug Service in 2000/2001. The questionnaire obtained information concerning the pattern of PST use, methods of preparation, its physical and psychological effects and their history of opiate use. The study was approved by the Wellington Ethics Committee and all patients gave written informed consent.

Morphine and codeine levels were analysed from four samples of PST prepared according to different methods. The extracts were assayed at the toxicology laboratory at Canterbury Health for the concentrations of morphine and codeine by standard gas chromatography (Agilent 6890N attached to an Agilent 5973N MSD, utilising a DB1-ms column).

Results

There were 37 opiate-dependent patients referred to the clinic during the period of the study (Figure 1). Of these, 13 patients were discharged or lost to follow-up prior to the patients being approached to participate in the study; four of these 13 patients were known to be PST users.

Patient characteristics

There were 24 patients who were approached to participate in the study, with all giving written informed consent and completing the questionnaire. Of these 24 patients, 13 (54%) denied ever using PST (10 female, median age 33 years, range 21–51 years) and 11 (46%) patients reported having used PST (seven female, median age 27 years, range 22–44 years) (Table 1). All 11 patients who had used PST were opiate-dependent by *Diagnostic and Statistical Manual* version IV (DSM-IV) criteria, and most had multiple

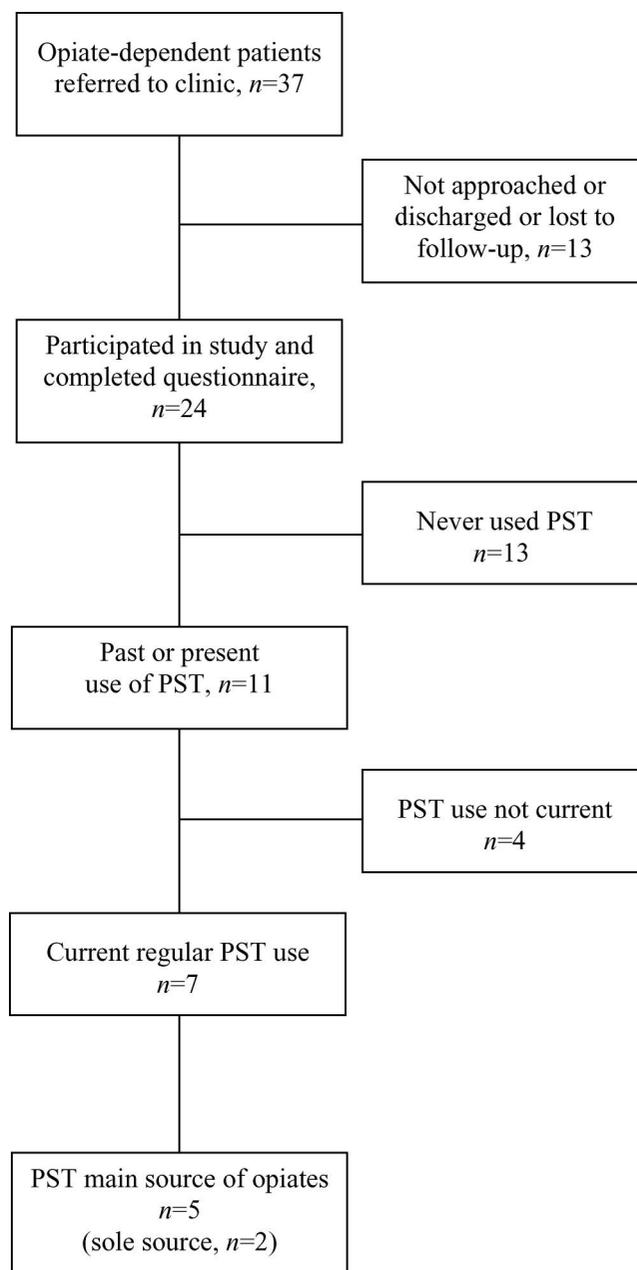


Figure 1. Classification of patients included in the study.

Table 1. Characteristics of patients

Subject	Age	Sex	Current use	Comorbidity
1	35	F	Yes	Anxiety
2	29	M	Yes	Gilbert's syndrome
3	27	M	Yes	Hep C +ve
4	23	F	Yes	Bipolar, Hep C +ve
5	25	M	Yes	Hep C +ve
6	34	F	Yes	–
7	22	F	Yes	–
8	23	F	No	Bipolar
9	44	F	No	Hep C +ve
10	38	M	No	Depression, Hep C +ve
11	22	F	No	–

comorbidities including chronic hepatitis C and psychiatric disorders (Table 2). No subjects reported PST as their initial source of opiates, with all having taken intravenous (i.v.) opiates prior to their use of PST. Most of the patients also reported non-opiate drug abuse, predominantly with amphetamines and marijuana. No patients had attempted to inject concentrated PST.

PST use

Seven patients currently used PST on a regular basis and four reported previous use, although one of these patients had used PST on only one occasion. In five patients currently using PST, it represented the major source of their opiate use and in two patients PST was the sole source of opiates (Figure 1).

Effects of PST

The patients reported a median onset of effect of 15 minutes (range 5–60 minutes) after ingestion of PST. They also reported a prolonged duration of action with the effect lasting a median of 24 hours (range 12–24+ hours).

Physical effects reported by the PST users included nausea and vomiting, appetite suppression, muscle tightening or a strange feeling in the legs and a slowing-down in respirations. Psychological effects included a feeling of calmness, euphoria and other symptoms of opiate use. Several risks were identified by the patients, including a concern that there may be toxins or pesticides included in the tea. Some were also concerned that chronic ingestion of the PST may lead to toxicity to the liver.

Some of the patients commented that the use of PST reduced the severity of or prevented withdrawal, and enabled better control of their opiate use. Its use was convenient and cheap, and some commented that its use allowed them to get away from the 'opiate injecting

scene'. All patients commented that the taste was awful, and was the main limiting factor in its use, leading to its discontinuation in some of the patients. No patients had experienced an overdose or knew of anyone in whom an overdose with PST had occurred.

Methods of preparation

All participants volunteered differing recipes for the production of the tea. The methods differed in terms of the use of hot or cold water, short or long periods of soaking, use of acidity (citric acid or lemon juice), reducing volume by boiling and the addition of fruit-flavoured powder. Patients reported that the whole process would normally take between 1 and 2 hours, which had implications for the structure of their day, the role of the cook in the household and the need to vary the quantities prepared. The patients' daily use varied, with between 0.25 and 3 kg of poppy seed prepared in water (Table 2). In all cases, the PST was taken orally with no subjects reporting i.v. injection of the solution or smoking a preparation of the poppy seeds. In all cases poppy seed was the opiate source, with no reported use of locally grown poppy extracts.

Opiate concentrations in PST

In the four samples of PST which were prepared for analysis, the concentration of morphine ranged between 10 and 105 mg/kg of poppy seeds and the concentration of codeine between 3.1 and 11.2 mg/kg of poppy seeds. The patients estimated that 1 kg of seeds had an effect equivalent to 45–160 mg (median 65 mg) of i.v. morphine.

Discussion

This study has identified that PST is used widely among opiate-dependent patients presenting to an alcohol and drug clinic in New Zealand. About 40%

Table 2. Characteristics of poppy seed tea use

Subject	Main source	Amount of poppy seed used (kg)	Frequency of use	Duration of use
1	Yes	0.75	1 × daily	> 1 year
2	No	0.5	1 × daily	4 months
3	No	0.5	< 1 × month	> 1 year
4	Yes	0.02	1 × daily	< 1 month
5	Yes	0.3	≥ 1 × daily	> 1 year
6	Yes	1.0	1 × daily	> 6 months
7	Yes	0.5	1 × daily	3 months
8	No	0.4	once	once
9	Yes	up to 3.0	≥ 1 × daily	> 1 year
10	No	0.5	1 × week	1 month
11	No	1.0	< 1 × month	1 month

of all patients presenting to the clinic had used PST routinely, with about half current users reporting that it was their main source of opiates.

These findings suggest that the pattern of opiate use derived from poppies changed during the 1990s in New Zealand. In the early 1990s about half of opiate-injecting drug users entered into methadone programmes were using opium poppy extracts on presentation, as well as a variety of other opioids [9,10]. These opium poppy extracts were obtained from locally grown *Papaver somniferum* plants, rather than from commercially available poppy seeds. The more recent appeal of poppy seeds from supermarkets is likely to be related in part to the fact that they are cheap, costing around \$NZ8–16/kg, compared with the 'street' price of long-acting morphine sulphate tablets being around \$NZ1–2/mg at that time. Other potential advantages include their supply not being regulated, that the opiates are extracted easily, ingested orally and the complications associated with intravenous injection can be avoided. In addition, the effects are long-acting, and together with the ability to vary the dose means that users are able to self-manage their opiate dependence.

While the findings are limited by the small cohort of patients interviewed, a number of observations can be made regarding their personal experiences. The first is that no users of PST reported its administration by injection and none had experienced or knew of anyone who had experienced an overdose. Adverse effects noted commonly were the physical and psychological effects associated with opiate use. The common experiences of nausea and vomiting were reported in conjunction with vivid descriptions of its disgusting foul taste and smell. There were concerns expressed about the possibility that the PST may contain toxins and pesticides that could potentially harm their health. There is some basis for these concerns, in that there has been a report of the presence of significant levels of the herbicide carbendazin in opium poppy material [11].

The patients also provided preliminary data regarding the potential of PST use to wean off other forms of opiates. Five of the 11 patients currently using PST had been able to replace i.v. morphine with PST as their main source of opiates. Indeed, two of the PST users had been able to withdraw completely from i.v. morphine use, thereby reducing the medical and social risks of illegal intravenous opiate administration. This experience is relevant to the difficulties that i.v. opiate addicts have with medically supervised, forced (police) or self-detoxification [12,13]. In some respects the pattern of use of PST by these opiate-dependent patients could be described as an 'unsupervised, self-administered methadone-type withdrawal programme'. Notwithstanding this description, PST represented an opiate of abuse, used frequently in conjunction with

other opiates, and maintained dependency in most of the patients who used it.

There was a favourable time course of opiate action noted by users of PST. Most patients noted the onset of an effect within 15 minutes and reported that it lasted for at least 24 hours. This time-course of effect was longer than predicted, contrasting with the reported duration of action of oral morphine of around 4–7 hours [14]. However, it did mean that most patients drank the tea once a day, although there were a number of variations in this approach, including sipping the solution regularly throughout the day.

The concentrations of opiates obtained in our study are within the wide range which has been reported in the literature [15]. We observed concentrations of morphine of 10–105 mg/kg of poppy seed, which is within the 2–251 mg/kg range observed from tea derived from poppy seeds from different countries. Similarly, the 3–11 mg/kg of codeine measured is within the 0.4–57 mg/kg range from poppy seeds sourced from different countries. It is well recognised that there is a wide range of morphine and codeine concentrations in poppy seeds obtained from different sources, which presumably reflects differences in concentrations between species and differing methods of cultivation, and extraction of poppy seeds during harvesting [16–18].

Another significant variable is likely to be in the preparation of the tea. All patients used different methods, varying in the length of soaking and the inclusion of agents such as lemon juice or citric acid. In terms of the length of time the seeds are soaked, some users advocate a lengthy (12-hour) soak while others prefer a brief (10–20 minute) wash, the theory being that a shorter wash does not allow the seeds themselves to absorb water with dissolved morphine. It has been shown that soaking seeds in water for 5 minutes with constant agitations extracts around 50% of the morphine and codeine contained in the poppy seeds [6].

The inherent variability in opiate concentration potentially complicates treatment of a patient wishing to cease using PST, and titration of a prescription opioid substitute to assist detoxification may be difficult. Consequent to the extensive first-pass metabolism in the liver, the bioavailability is less than 50% with oral consumption of morphine [14].

Public health implications

This pattern of opiate use could be considered favourably within 'harm reduction' philosophies because of its much lesser financial and criminal impact from its availability as a low-cost legal food substance. In addition, use of PST has the potential to reduce the incidence of blood-borne viruses through the associated avoidance of intravenous drug use, lessen the risk of

opiate overdose and reduce the socio-economic disruption associated with opiate dependence. Although there is a potential that PST might act as a 'gateway drug' by inducing dependence and introducing people into the more serious culture of drug abuse, this pattern was not observed in the patients participating in the study. Furthermore, the foul taste and smell are likely to represent significant barriers to initial experimentation with this source of opiates. It remains to be seen what role PST or other homemade poppy-based products has in the opiate use culture internationally.

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