Morphine and codeine in the water extract of poppy straw: a traditional substitution used by drug users in Calcutta, India

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Abstract

Since the introduction of methadone in the 1960s, a variety of other substances have been proposed and piloted as substitutes for opioids. Recently, with the growing problem of HIV/AIDS and other blood-borne infections among drug users, oral substitution therapy has been given more importance. This paper reports on findings of an exploratory study examining the possibility of using liquid extract of poppy straw (broken pieces of poppy shell after extraction of opium seeds) as a substitute for heroin. The paper is based on observations of drug users in Calcutta, India, found drinking liquid extract of poppy straw, interviews with a sample of 103 injecting drug users (IDUs) and 39 non-IDUs, and chemical analysis of poppy straw extract. Eighty-two percent of IDUs and 72% of non-IDUs who had used poppy straw in the last year reported that it provided at least some relief from withdrawal from heroin. Findings from these two sub-studies suggest the possibility of using liquid extract of poppy straw as a substitution for heroin as well as a novel harm reduction approach for reducing blood-borne infections.

Keywords: Injecting drug use; Poppy straw; HIV; Harm reduction; India

Introduction

Since the introduction of methadone in the 1960s, a variety of other substances have been proposed and piloted as substitutes for opioids. Recently, with the growing problem of HIV/AIDS and other blood-borne infections among injecting drug users (IDUs), oral substitution therapy has been given greater prominence. This paper reports on findings from two exploratory studies conducted in Calcutta, India, describing first the use of liquid extract of poppy straw by IDUs and second, laboratory analysis of liquid extract of poppy straw. The first study, based on ethnographic observation of drug users and data collected through individual interviews with IDUs, describes the practice of drinking liquid extract of poppy straw soaked overnight in water. The second study reports on laboratory analysis of the poppy straw extract to determine its quantity of morphine and codeine. Taken together, the paper raises the possibility of using liquid extract of poppy straw as a substitute for heroin in the context of interventions oriented to harm reduction.

Study 1: Ethnographic observation and interviews

During data collection for an assessment (a different study) conducted to develop HIV prevention interventions, a number of opioid drug users were found drinking liquid extract of poppy straw. It was decided to conduct systematic observations as well as interviews with IDUs and non-IDUs involved in heroin and opioid use to further examine this practice. The observations and interviews were conducted by two researchers over a 2-month period. Observations were undertaken at various locations where drug users were found...
to congregate either to buy and/or sell drugs or use drugs with others. These included a number of small neighbourhood parks, some of the low-income residential neighbourhoods, a number of tea/coffee shops within the neighbourhoods, and areas surrounding the local shopping market.

Both IDUs and non-IDUs were observed preparing and drinking poppy straw extract. The preparation involved soaking the straw overnight in a bowl of water and drinking the liquid extract next morning. The residual solid mass of poppy straw remaining in the glass was then boiled with water and ingested again as the next dose in the evening. The use of liquid extract of poppy straw was more prevalent when drug users could not obtain heroin. As the poppy straw had to be soaked in water overnight, this tended to be done alone. However, in certain cases, drug users pooled their resources to buy poppy straw and divided the liquid according to contribution made.

In order to substantiate the initial findings from these observations, 103 IDUs and 39 non-IDUs were recruited from the street and interviewed. Data were collected on demographic characteristics, experience of using or experimenting with poppy straw water as a substitute for their usual drug of choice, and their assessment of its effect on withdrawal symptoms.

**Interview results**

The majority of IDUs were in their early thirties (Table 1). The most frequently injected drug was buprenorphine (known locally as TD, an abbreviation for the trade-name tidigesic). This was used alone or in combination with injectable diazepam, promethazin or chlorpheniramine maleate. All non-IDUs reported smoking heroin (known as brown sugar). Among 39 non-IDUs, 13 had injected in the past. Injectable heroin was not available in the city at the time of study. They bought buprenorphine at three times the price (Rs. 30–35; $1) of the retail market through clandestine arrangements with street drug dealers or pharmacists.

Of 103 IDUs, 68 (66%) had used poppy straw water as a substitution for injecting or chasing. A higher proportion of non-IDUs reported complete relief from withdrawal (Table 2). Reported limitations of using poppy straw as a substitute for heroin were "pleasure not as good as injecting buprenorphine or smoking heroin", "difficulty associated with preparing it at home", "difficulty in working/disturbance in sleep", and "constipation". Others mentioned the bitter taste of the preparation and a difficulty in purchasing the poppy straw. In most cases, depending on the strength of the water extract, most drug users felt almost immediate relief and it lasted long enough for them to be able to avoid withdrawal. None of the users we interviewed reported injecting the water extract.

**Study 2: Laboratory analysis of water extract of poppy straw**

Laboratory analyses were conducted on the water extract of poppy straw as a means of verifying and estimating the concentration of morphine and codeine in the extract. The poppy straw was bought from the local market for chemical analysis. Tap water was used for preparing the extract in order to mimic the natural conditions under which drug users prepare the extract. A high-performance liquid chromatographic (HPLC) technique was employed to estimate the concentration of morphine and codeine in the extract.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Characteristics of the study population</th>
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<tbody>
<tr>
<td>Characteristics</td>
<td>All drug users (n = 142)</td>
</tr>
<tr>
<td>Age: median (mean ± S.D.)</td>
<td>31 (32.7 ± 7.2)</td>
</tr>
<tr>
<td>No formal education</td>
<td>41.5%</td>
</tr>
<tr>
<td>Married</td>
<td>55.6%</td>
</tr>
<tr>
<td>Ever jailed</td>
<td>85.2%</td>
</tr>
<tr>
<td>Unemployed</td>
<td>33.8%</td>
</tr>
<tr>
<td>Percent began using drug</td>
<td>55.6%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Relief from withdrawal symptoms among those who tried poppy straw water as a substitution for injecting or chasing*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relief from withdrawal symptoms</td>
<td>Injectors (n = 68)</td>
</tr>
<tr>
<td>Did not help</td>
<td>12 (17.6%)</td>
</tr>
<tr>
<td>Some relief</td>
<td>38 (55.9%)</td>
</tr>
<tr>
<td>Complete relief</td>
<td>18 (26.5%)</td>
</tr>
</tbody>
</table>

*Smoking heroin.

dose. A little less than a third used a greater amount of poppy straw ranging from 50 to 100 g; a few soaked 25 g of the substance overnight.

More than a quarter (26%) of the IDUs mentioned that they experienced complete relief from withdrawal symptoms by drinking the water extract of poppy straw. The majority of non-IDUs reported complete relief from withdrawal (Table 2). Reported limitations of using poppy straw as a substitute for heroin were "pleasure not as good as injecting buprenorphine or smoking heroin", "difficulty associated with preparing it at home", "difficulty in working/disturbance in sleep", and "constipation". Others mentioned the bitter taste of the preparation and a difficulty in purchasing the poppy straw. In most cases, depending on the strength of the water extract, most drug users felt almost immediate relief and it lasted long enough for them to be able to avoid withdrawal. None of the users we interviewed reported injecting the water extract.
Discussion

These studies highlight the practice of drinking liquid extract of poppy straw as well as the presence of a considerable amount of morphine (3.3 mg) and codeine (10.3 mg) in the extract (7.5 g). It is unclear whether this amount can combat withdrawal symptoms. However, the findings raise the possibility of using water extract of poppy straw as a substitute for injections of heroin and buprenorphine.

Because of the growing concern about the spread of blood-borne viruses like HIV, Hepatitis B and Hepatitis C among IDUs, including in India, substituting injecting with an oral alternative—such as buprenorphine—is given serious consideration by several agencies in the country (Dorabjee, Samson, & Dyalchand, 1996). A recent study conducted in Calcutta identified an increase in injecting drug use and the risks associated with it (Panda, Chatterjee, Sarkar, et al., 1997). A substance that could combat withdrawal symptoms and help facilitate a change to oral drug use is, therefore, of immense potential importance.

However, it is important to make some cautionary points. It is necessary to take into account the fact that buprenorphine is 25–40 times more potent than morphine; the bio-availability of oral preparation is less than for its parenteral form and, in contrast to morphine, it is approximately two-thirds as effective orally as parenterally (Cowan, Doxey, & Harry, 1977; Gilman, Goodman, Rall, & Murad, 1985). One participant reported experiencing severe toxicity following ingestion of overnight water extract of 100 g of poppy straw. However, a number of participants reported complete substitution of injecting and/or smoking heroin with the drinking of poppy straw water, a behaviour change that lasted for 4 months to 2 years. As most of the participants reported taking 6 mg of buprenorphine injection (2 ml ampule containing 0.3 mg/ml) per day, it might be presumed that 50 g of poppy straw mixture could act as a useful substitute; the equivalent to taking 21 mg of morphine and 70 mg of codeine orally. In addition to considering the lesser bio-availability in oral administration compared to injection, there is the possibility of the presence of other alkaloids in the water extract of poppy straw like thebaine, papaverine and noscapine. Supervised trial and dosage titration would be necessary before suggesting a prescription.

Liberating the use of poppy straw water may be prudent at this time. The narcotic department of police in the city has recently prescribed the sale of buprenorphine tablets. In this context, poppy straw water could be a useful substitute for heroin users in the region who do not choose detoxification and/or abstinence as an alternative to injecting drug use.

References


