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Distribution of Intravenous Injection in France

Heroin use depends on numerous routes of administration. This substance can be ingested, sniffed (nasal route), injected, or smoked (pulmonary route). For each individual, these routes are not interchangeable or equivalent in terms of risks, as well as they do not lead to similar consequences. When it comes to heroin, each route of administration presents risks and can result in specific pathologies. The intravenous injection appears to be the most dangerous of all. Its role has been brought about by many current sanitary problems, especially infectious pathologies transmittable through blood route, like HIV infection, hepatitis B and hepatitis C. When comparing the rate of HIV infection according to the modes of administration (injectable or smokable), English authors notice there is a epidemiological boundary in Great Britain between areas where injection is the main route of administration (Scotland and London region; with a high level of contamination, 44% and 33% respectively) and areas where smoke inhalation prevails (Merseyside; with a rate under 1% [2]. When comparing a group of heroin injection users with a group of heroin smokers, other researchers pointed out that the HIV infection prevalence among individuals exclusively resorting to injection amounted to 19%, whereas it reached 3% only among smokers [4]. In 1997, the French declared HIV prevalence among individuals treated in specialized centres for drug addicts amounted to 20% in Île-de-France and Provence-Alpes-Côte-d'Azur regions, where the intravenous route is widely used versus 3% in such region as Nord-Pas-de-Calais, where the inhalation mode prevails [15].

Fatal and non-fatal overdose-related accidents are due to the intravenous injection. In a Dutch retrospective survey covering 34 deadly cases following a heroin use, 81% of the latter were the result of an intravenous injection and 12% consequential to sniffing. Only one case due to inhalation was listed [7]. When comparing the nasal, pulmonary, and intravenous routes, other authors conclude that the later mode is closely related to the highest degree of addiction [3].

In France, the intravenous injection is most prominent, whereas in other European countries alternative modes, less risky in terms of public health, have emerged. Considering a given period and a given geographical area, why do users "choose" a specific mode of administration, whereas others "choose" another one for the same substance ? That question has been debated throughout surveys and publications; the international book review provide information about determining factors likely to favour or block off the transition between whatever heroin-related route of administration. The main determining factors can be listed as follows:

- The effects users are searching for;
- The making-up, the purity degree, and the form of heroin available;
- The cost of the substance;
- The consumption habits in whatever group the user is belonging to.

The determining factors for choosing a specific mode of administration

The sought-after effects: according to its route of administration, heroin will immediately cause more or less intense effects. The intravenous injection and the smoke inhalation ("chasing the dragon"[1]) provide an instantaneous sensation of intense pleasure, commonly termed "flash", which users connect with sexual climax. It is quite difficult, even impossible, to obtain such an effect through nasal route[2]; that way, smoke inhalation is considered as the only mode of administration likely to challenge intravenous injection.

Chemical making-up of heroin available on the local market: heroin exists on a basic or a hydrochloride form. Although the essential component of that substance is identical in both cases as far as pharmacology is concerned, these two forms are different according to the usable route of administration:

As the ***hydrochloride form*** is water-soluble, it is then also perfectly adapted to injection or sniffing yet not to pulmonary route (smokable), for when heated, the hydrochloride form is apt to decompose instead of volatilize.

As the ***basic form*** is not much water-soluble, it is then unsuitable for injection, whereas when heated it does not decompose but volatilize. The basic form is then likely to be smoked.

Purity degree and blending: most of the time heroin is automatically mixed with other substances, also called "blending substances". The main purpose of such an operation is to increase the quantity sold in order to make more profits. Contrary to injection, "chasing the dragon" and sniffing appeal to the senses of smell and taste. That way, a substance that is too blended is likely to provoke repulsion when smoked, or to fail nasal mucous membranes absorption when sniffed.

The user's cost for each modes of administration: compared with other routes, injection may be considered not only as the most efficient and the quickest but also the cheapest one. Contrary to the latter, smoke inhalation implies losing a certain percentage of the substance when burning. The price per quantity of pure heroin absorbed is then less high in the case of intravenous injection. Having enough money or an access to a cheap substance may become incentive factors for leaving injectable route. On the other hand, a price increase or a lack of financial means may favour resorting to injection.

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1 Set on sheat of paper, heroin is heated then inhaled orally through a straw.

2 Whereas the interval between an heroin take and the effects apex amounts to two or three minutes when using a nasal route (sniffing), il only reaches a few seconds when smoke injection and inhalation are concerned. Thanks to the high number of absorbing air cells in the lungs and the quick surge in the brains, inhalating heroin smoke is supposed to produce more intense (if not equivalent) effects than those of injection.

Heroin modes of use in the Netherlands, Great Britain, and the United States

Modes of administration which have developed in these three countries can be observed in order to understand the French situation better. In the Netherlands from the 70's onwards, and since the beginning of the 80's in Britain, injection has been gradually left to be replaced by smoke inhalation. In the USA and France, such a process was just about missing at the same period.

In the Netherlands, two routes of heroin administration emerged during the seventies: injection and inhalation. In that respect, the Netherlands stood as an exception at a time when injection would prevail just about exclusively in every northern hemisphere countries. To explain that Dutch marginality, the Dutch authors [6][8] lay the emphasis on three major factors:
- The role of Surinamese, whose culture made them heroin smokers and strongly reluctant to use injection. They formed a solidly built up cultural group, using a mode of administration different from native habits. As they had furthermore conquered a monopoly over that substance small trafficking, the Surinamese pushers — notably through the control they would operate in the places where users bought and took heroin on the spot — were able to ban heroin use by injection in these particular places they controlled. Native heroin users were then prompted to initiate themselves into practising heroin smoke inhalation ("chasing the dragon").

- From 1973 onwards, the outbreak of a specific hydrochloride form of heroin called *Brown Sugar*, with a caffeine high-grade, adapted to smoke inhalation mode of use, and, from the early 80's onwards, the emergence of the basic form specifically prepared to be smoked.

- The purity degree stability of the heroin sold on the Dutch local market: concerning samples seized by the police then tested in labs, the purity degree remained high (between 40 and 60%) during more than two decades. That stability ran parallel with a stability in retail prices.

A retrospective analysis of the data collected in 1989-90, among two groups of heroin addicts in Amsterdam (AIDS group, N = 282) and Rotterdam (admission to methadone programme group, N = 711) shows that individuals not using injection were a minority among those who began their consumption around 1970, whereas they became a majority among those who began it by the late 70's and the early 80's.

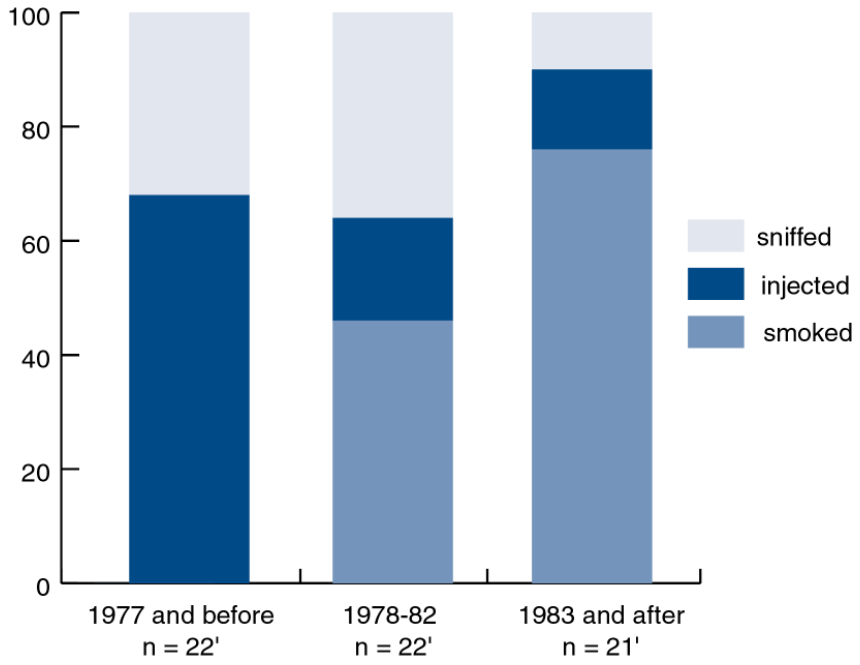
In 1960's Britain, heroin addicts seldom began using heroin with other modes than injection. On the other hand, by the late 80's new heroin users would resort to pulmonary route. To explain such a change, researches underlined the relevance of a specific factor, already met in the Dutch case, to wit: a high purity degree in the substance, scarcely below 30%. Besides, more recent qualitative researches brought out two other factors:

- From 1979 onwards, the British illicit market was supplied with basic form heroin.

- When compared with the hydrochloride form, that heroin was 25% cheaper.

Gradually new users began smoking heroin and gave up injection.

First route of administration used according to the onset year of heroin addiction (N = 65)



Source: Griffiths P., et al.: Extend and nature of transitions of route among heroin addicts in treatment, British Journal of Addiction, vol. 87, (1992).

A retrospective survey covering 65 heroin addicts, selected in a drug addiction specialized centre, divided up into three groups according to their first year of heroin use, shows that nobody smoked heroin among those who began in 1977, whereas this route of administration became a majority among those who began in 1983 and later.

In the United States, the analysis covering the files of 1 011 opiate addicts, admitted between 1935 and 1965 in Lexington hospital, specialized in treating addiction, and the analysis of 65 taped interviews in the late seventies[3], [9][1] show that two factors contributed towards introducing, distributing, and perpetuating the intravenous injection practice:

- The first factor is connected with law-enforcement policies taken at the turn of the century towards natural opium importing. The following importation collapse made smokable opium become in short supply on the local market. Old smokers would then convert to morphine and medically delivered heroin injections (non smokable form), legally prescribed until 1915, when the Harrison Narcotic Act (which restricted

[3] Within the context of a verbal history project with methadone-treated patients, whose drug use began in the twenties and later.

delivery) was officially adopted. Such a practice became widely spread until 1930. Around 1945, it can be observed that the intravenous route had become the prevailing mode among American morphine and heroin addicts.

- The second factor depends on the long-lasting worsening of the heroin sold on the illicit market. The successive "blending" made the substance unsuitable for other routes of administration. According to the American authors this factor was not only responsible for the intravenous mode development among American drug addicts but also the main hindrance to the circulation of other routes of administration.

The intravenous injection still prevails in France

For a better valuation of the French situation complex reality, it is first of all necessary to analyze the historical process that lead to the development and the prevalence of intravenous injection in that country, and secondly the factors which held and still hold up the circulation of an alternative mode of administration.

The outbreak and prevalence of intravenous injection: in France, the injection practice goes as far back as the discovery of hypodermic syringe in the middle of last century. Cases of intravenous injections are seldom mentioned in literature by the end of that century [14]. At that time, the most frequent modes of administration were the pulmonary route (opium) and the hypodermic injection (morphine). In the early twenties, the intravenous injection practice seemed to begin its circulation process. The first specific medical description of a case of heroin addiction by intravenous route dates back to 1930 [11].

When considering researches of that period, it may be concluded that the transition to the intravenous route depended on two factors: on one hand, the rise of heroin, which gradually replaced other opiates and proved more adapted to intravenous injection than morphine; on the other hand, the dramatic increase of heroin price during W.W.II.

In 1953, a survey covering 586 drug addicts files in the Seine département (Paris and its close suburbs) showed that injection was the mode of administration used in 86% of cases [13].

The selection process of modes of administration carried on throughout the 50's and 60's to reach the standardization of the intravenous route in the 70's. At that time, resorting to other injection modes, hypodermic and intramuscular, oral, rectal, or smokable had became scarce.

Elements that could explain the difficulties of circulating an alternative mode for injection

The form of heroin available. Since the early 50's, two kinds of heroin had been at least coexisting in France:

- The medical use heroin (termed "therapeutic") in its hydrochloride form (injectable ampoules), legally and medically prescribed, or obtained through fake prescriptions;
- The illegal market heroin in its white powder form (termed "Marseillaise"), mainly produced by the *French connection* for the American market. An increasing part of that production was gradually disposed of on the French local market in order to compensate for the lack of medical heroin supplied by pharmacies, and to meet the increasing needs of 1960's users.

Until 1973, the form of heroin available on the market was suitable for injection (solution) when medically issued, for injection or sniffing (powder) when issued from an illicit trafficking. In other words, during the developing phase of "modern" heroin addiction, the user could just about choose between two alternatives: injection, and to a lesser extent sniffing, both forms of heroin available that were not adapted to the smoke inhalation practice. At the end of 1973, the outbreak of the smokable hydrochloride form of heroin (*Brown Sugar*) did not however help the transition from the injectable mode of administration to the smokable one. The most plausible explanation could be that that route of administration was seldom known around France at that time.

In the early eighties, the basic form of heroin (imported from South-Western Asian countries) emerged. In 1981, it stood for 20% of heroin seizures in France, and it made up the majority of seizures from 1983 onwards [10]. Except for the Lille area, where the "chasing the dragon" technique began probably to appear in the first half of the eighties, and contrary to their English counterparts, the French heroin addicts did not alter their usual mode of administration to adopt the smoke inhalation one. The French heroin addicts carried on injecting a substance that was mainly suitable for smoking, and even in a period (1982-87) when syringes could not be sold without prescription.

The price of the substance: globally speaking, when compared to neighbouring countries, the retail price of heroin in France remained high, apart from the Lille region. Thanks to its closeness to the Netherlands and Belgium, the price of basic heroin there could reach half, or even the third, of the usual price in other regions. This constant moderation of the price seems to have played a significant part in the outbreak and the setting-up of "chasing the dragon", as far as the users living in that area could afford sacrificing some percentage of the substance when burning it.

Purity degree and blending substances: from the second half of the 70's onwards, the quality of heroin available to users has steadily worsened. In 1991, the Lyons Scientific Police Laboratory listed 22 different blending substances among the analyzed samples. Between 1995 and 1997, an inventory of 45[4] was made. During the same period, the percentage of samples containing less than 20% of pure heroin nearly doubled up (from 40 to 70%); on the other hand, the number of those containing more than 20% was split in two.

The lack of a challenging model: as explained above, circulating the "chasing the dragon" technique in the Netherlands was due to two cultural models facing each other: the native one and the Surinamese one. In France, most of the heroin users, who began consuming in the sixties, lived throughout an injection dominated culture. Except for the Lille area closely in touch with Dutch users, especially from Rotterdam, a group similar to the Surinamese "model" was never able to emerge.

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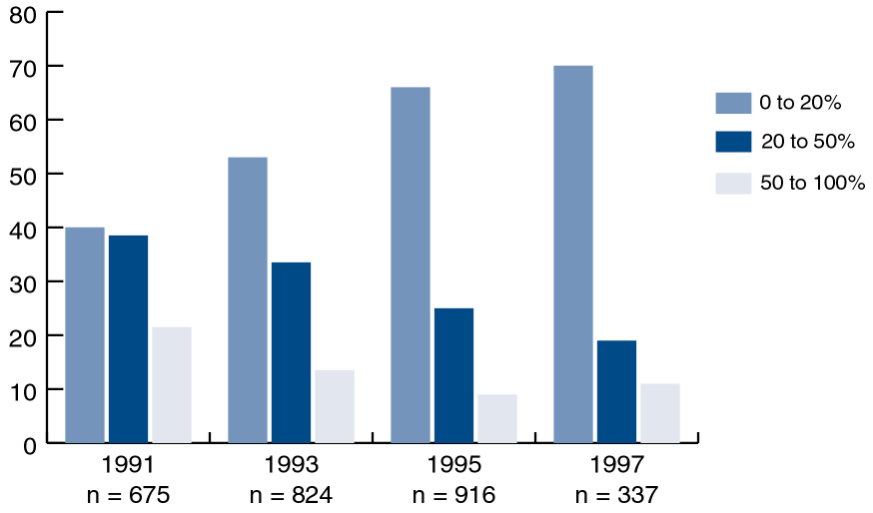
[4] The main blending substances listed are: caffeine, paracetamol, mannitol, procaine, meconine, phenobarbital, diazepam; saccharose, and glucose, some carbonates.

Evolution of the purity degree in the heroin analyzed in France between 1991 and 1997



Source: Scientific Police Laboratory in Lyons, National Database of Drug Seizures, 1991-1997

The first group of heroin users to be ethnically and culturally different was made up of North African young natives from 1980 onwards. It possessed a solid tradition of smoked cannabis use and was strongly prejudiced against injection. Yet these North African heroin addicts were quickly absorbed by the prevailing local model resorting to intravenous injection [12].

West Indians, the most recent component of the addicted population (early 90's), were mainly smokers, yet two factors limited their influence: first of all, they smoke crack most of the time, and secondly their number proves of no significance outside Paris. Furthermore, if one part of these West Indians carries on inhaling crack, the same cannot be said as far as heroin is concerned, the latter being most frequently intravenously injected. As the drug addicts originating from Maghreb, they were also absorbed by the leading injection model.

Conclusion

National and international publications tend to prove that the circulation a given mode of administration cannot be explained by one factor only, but is due to many factors put together, the latter being socio-cultural, economical, and resulting from specific effects the user is looking for.

In France, as nearly everywhere in Europe and the United States, the long-lasting intravenous mode of administration was connected with the availability of the only injectable form of heroin. When, from the first half of the seventies onwards, the smokable forms emerged, the stopping of the circulation of the heroin smoke inhalation alternative practice is essentially due to the bad quality of the heroin available and its high price.

Even in today's French global use decrease context, informing heroin users and other injectable substances users about alternative and less risky modes of use means a major challenge for public health.

Abdalla Toufik

- **For more information**

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Tendances

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