

Original Articles.

A PRELIMINARY NOTE ON ADDICTION TO "POST" (UNLANCED CAPSULES OF *PAPAVER SOMNIFERUM*)*

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Historical and General.—The properties and uses of the capsules of the opium yielding *Papaver* were known long before the Christian era. Various species of the poppy have been cultivated as ornamental garden plants and have been mentioned by writers from the earliest times. There is little doubt that the merits of the seeds as a food were recognised much earlier than the somniferous property of the capsules, and it is also certain that the soporific and narcotic properties of the capsules themselves were appreciated long before their recognition in its milky sap. The capsules have been employed in the preparation of soporific drugs or in the preparation of stimulating and soothing beverages from time immemorial. According to Watt, *Papaver somniferum* was grown in Asia Minor many centuries ago for its capsules, and the Arabs carried the dried poppy heads to the eastern countries including China, even before the inspissated juice was taken and its properties made known to the inhabitants of those regions. The medicinal properties of the plant and its capsules were fully known during the early classic period of Greece and Rome. The Egyptians had been using poppy capsules long before the 1st century A.D. The early Chinese works mention the Arabs exchanging poppy heads with Chinese merchants. There are records to show that the Arabs instructed the Chinese to prepare from these capsules, a soporific beverage and medicine before they knew anything about the properties of opium.

It will thus be seen that capsules of the poppy aroused the attention of the human race long before opium was known. Little wonder then that after their narcotic and soothing properties were appreciated by those practising in the healing art, they became known to the laity, who made use of them for purposes of satisfying the almost universal desire which human beings possess for a stimulant or a sedative.

Medical uses of poppy capsules.—Poppy capsules have been used in both the Ayurvedic

or the Hindu medicine, and the Tibbi or the Mohammedan medicine for many centuries, as a sedative both for internal use and external application. The *hakims* prescribe them for headache, diarrhoea, dysentery and digestive troubles in children. They are used as a household remedy in many parts of India and are given during the teething periods by mothers to their children to keep them quiet. An infusion prepared from the poppy heads is used as a soothing application for bruises, inflamed, excoriated and swollen parts and sometimes as an application for various forms of painful conjunctivitis, inflammation of the ears, etc. Fomentations with poppy heads are even now applied to painful inflammatory swellings. In China the physicians used them freely in the early centuries of the Christian era. Most of the T'ang Dynasty medical writers and from them onwards, extol the merits of poppy capsules in the treatment of dysentery, especially when combined with astringent drugs.

Use of poppy capsules for euphoric purposes.

—It is well known that the use of articles of stimulative, restorative or sedative character, is bound up with the natural history of human beings from the very earliest times. The use of such articles as cocoa, coffee, tea, opium, alcohol, etc., to procure an added feeling of pleasure, has been recorded long before the history of civilisation. All of them in moderate quantities, produce a favourable effect on the mental conditions of man. Whether they have a stimulating or a depressing effect on the central nervous system, they all produce an enhanced sense of well being or euphoria. The capsules of the poppy were used very early for this purpose. Whatever may have been the case in the countries of its origin (e.g., Asia Minor), there appears to be little doubt that poppy heads began to be used for euphoric purposes in India soon after the introduction of the poppy plant into the country. There the plant was known as *koknar*, the capsules were called *goza*, *khol-i-koknar* or *post-i-koknar* or simply *post* or *post doda*. In the time of the Moghuls a beverage made from the poppy capsules known as *kuknar* was very commonly used throughout the country. Abul-Fazl in his *Ain-i-Akbari* mentions about the Emperor himself taking this drink. He says "whenever His Majesty is inclined to drink wine, or take opium or *kuknar*, trays of fruit are set before him." The use of the word *kuknar* apart from opium in the above passage shows that both the poppy capsules and the inspissated juice or *Afyun* were used. According to Watt the beverage *post* at present taken in the Punjab, closely resembles *kuknar* which was a luxury among the Mohammedans in the time of Akbar. There is also mention of a beverage known as *Char-bughra* which was a mixture of wine, hemp, opium and poppy capsules. Many other references in the Moghul literature

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indicate the extent to which the habit of drinking *post* or *kuknar*, prevailed among the Indians during the 16th century and later. During the 17th and 18th centuries the use of *post* was very prevalent, as is evident from the remarks of various writers of that period. The people in those days grew poppy and used it in any way they liked; the use of the capsules for euphoric purposes appears to have been very prevalent for that reason. In the history of the Punjab during the time of the Sikhs, there are many references to *post* drinking, but it is not possible to form an idea as to the extent to which the habit prevailed among the people. Since the introduction of restrictions in the cultivation of the poppy the temptation has been undoubtedly removed from the doors of the peasant, and we have no doubt that the habit has considerably decreased for that reason. Poppy heads are obtained now with difficulty and in most parts of India the beverage *post* or *kuknar* has become unknown.

Control over production, possession and sale of poppy heads.—Poppy cultivation is now mainly confined to the United Provinces under strict Government control. The only other parts of India, where poppy is allowed to be cultivated for poppy heads, are limited areas in the Punjab.

In that province poppy was freely cultivated before the British administration and there was a very wide range of addiction to poppy heads. The Government realised from the very outset the injurious effects of this pernicious habit and have been adopting measures to discourage its use as an intoxicant. To meet this object the cultivation of poppy heads was strictly restricted after 1901. The result was that in about two years' time, the habit almost died out from all other parts of the province except the central districts, e.g., Jullunder, Hoshiarpur and Ludhiana. After 1909 the growth of poppy for poppy heads was further restricted to Jullunder district and Hoshiarpur *tahsils* only, because of the high incidence of consumption which still existed in these districts. The area under poppy cultivation in these two districts is, however, very small, not more than a thousand acres yielding about 500,000 pounds of poppy heads, being cultivated. Only a small portion of this produce is used for medicinal purposes, practically the whole of it being consumed for euphoric purposes.

As regards the control exercised by the excise authorities on the production and consumption of poppy heads, it should be made quite clear that nobody is allowed to cultivate *post* unless he has obtained a license from the authorities of the district. During the harvest the produce is collected and weighed by the district authorities and entered in a register. Out of this produce the cultivator cannot sell a single poppy head himself. He is only allowed to sell the produce to the wholesale

vendor, who is a licensee of the Government. This latter keeps a stock and supplies to retail vendors according to their needs. No individual is allowed to possess more than two seers (4 pounds) of poppy heads, and the licensed vendor is forbidden to sell more than this quantity. The export and transport of poppy heads is not permitted without a pass issued by the local authorities. The wholesale and retail dealers must obtain a license if they wish to transport poppy heads from one part of these districts to another.

Present extent of poppy addiction.—Our enquiries show that the only part of India where poppy heads are used for euphoric purposes and where we found persons habitually addicted to them at the present time, are certain districts in the Punjab and parts of Rajputana States, especially Jaipur. In other parts of India one does meet cases here and there, but the addiction seems to have disappeared. We have tried to gauge the extent of this addiction in the Punjab generally and in the central districts particularly. A study of the consumption of poppy heads in the different districts of the Punjab shows that with the exception of the three central districts, i.e., Jullunder, Hoshiarpur and Ludhiana, the sale is practically negligible. This habit is, therefore, chiefly confined to these districts. It is somewhat more prevalent in the urban areas than among the rural population. The city of Jullunder and the adjoining villages show the greatest incidence, one shop in the city alone showed a sale of nearly 60,000 lbs. in the year. There are quite large rural areas in these districts which are quite free from addiction.

An addict seems to act like an infective agent and spreads the habit to others who come in contact with him. In the villages we were able to trace the spread of the habit to association with and on the advice of other addicts, who described the wonderful effects of the drug in all sorts of conditions.

As regards the number of addicts, it is very difficult to form an idea owing to there being no registration laws. It is, however, possible to form an approximate estimate from the total amount of poppy heads consumed in the province and the average dose, which we have been able to work out from a series of 530 cases which we have carefully studied. Assuming that the whole of the amount of poppy heads sold were used for euphoric purposes, the number of addicts could not be more than 6,000 to 7,000 in the whole province. Of these the majority are in the central districts, especially in Jullunder and Hoshiarpur. These districts have a large Sikh population but the addiction is not confined to this class only; it is also prevalent among other communities residing there. It is usually the lower grades of society in all communities who are addicted to this habit.

Preparation of the Beverage and Mode of its Consumption.—The *post* drinkers seek every opportunity to take the beverage in the company of their friends. For this purpose they assemble at specified hours in specified places, generally in the morning, afternoon and evening, for taking the drug. The places of assembly as a rule are unfrequented spots such as a clump of trees near a well, or an old grave, or an abandoned place of worship where they can drink unmolested. Such places are known as *d-ara* or *saki-khana*. There are a number of them in Jullunder city and in the villages around. Generally there is a man who either lives in these drinking places or at least spends most of his time there in looking after the establishment. He sits on a dirty piece of matting with a number of earthen bowls in front of him with quantities of soaked poppy heads in them. The capsules he buys at about 3 pice per *chhatack* (2 oz.) and sells them at 8 pice a *chhatack* after preparing the potion from them, thus making a little profit. He may supply ready-made *post* to the addicts on payment or he may be asked merely to supply an earthenware bowl and water and a coarse piece of cloth for straining the drink, to those who bring their own capsules. The dose is usually 5 to 6 capsules at a time. The addict puts the crushed capsules in a bowl half full of water (6 to 8 oz.), sits down and watches them till they become quite soft. The softened pieces are then broken into a fine pulp by rubbing them with the fingers and squeezing out the juice. In summer it suffices to soak the crushed capsules for not more than an hour, but in winter they are not infrequently soaked overnight. Whatever method is adopted the alkaloids present in the poppy heads gradually pass into solution in water and the process of rubbing with hands and fingers completes the extraction. When this is completed the mass is strained through a coarse cloth till all the juice is squeezed out. The beverage thus prepared is known as *post*, and is drunk immediately after its preparation. It is a pale yellowish looking fluid having a bitter taste and a peculiar faint aromatic odour. Most of the addicts take it in the morning and in the afternoon, but some take it 3 or 4 times a day or even oftener. As a rule the dose is kept below 5 *chhatacks* (10 ounces) per day, the large majority taking 1 to 2 *chhatacks*, equivalent to 3 to 6 grains of the total alkaloid. The drink usually takes 20 to 30 minutes to produce its effects and is frequently followed by a little tea with sugar or powdered ginger or cardamoms. It is believed that these accessories, especially the sugar, enhance the effects produced by the drug.

Besides the process of extracting the active principles by macerating the capsules in water, which has been described above, the addicts sometimes boil the capsules in water and drink

the infusion. Of late years capsules have been boiled with tea and the resulting beverage is taken with sugar and milk in the usual manner. In these districts we found tea infused with poppy capsules was being sold to the addicts, probably without the knowledge of the excise authorities. Green, ripe capsules are sometimes used; they are fried in butter or *ghee* (clarified butter) and are eaten by the addicts. The preparation is known by the name of *bhunji* and is believed to have similar effects as *post*. Sometimes the juice of the green poppy capsules is extracted and a sweet called *halwa* is made from it.

Effects produced by habitual use of poppy heads or 'Post.'—We have not been able to find in the medical literature any account of the symptoms and effects produced by the use of poppy heads on those who habitually indulge in them. We, therefore, made a very careful study of 530 addicts and made an analysis of the symptoms as well as the physical, mental and moral effects produced by the drug.

The symptoms and effects produced by opium and poppy heads differ more in detail rather than in their general aspect. These naturally differ with the doses taken, duration of the habit and the individual idiosyncrasy. On the whole it may be said that the effects of the capsules are milder but not so lasting as opium, as the former drug has to be taken more frequently. A chemical analysis of the poppy heads carried out in our laboratory shows that they contain 30 per cent. of narcotine and papaverine, 26 per cent. of codeine, 4.5 per cent. of morphine and 39.5 per cent. of the other alkaloids. It will be seen that the amount of morphine itself is very small as compared with that in opium. Although most of the opium alkaloids depress the psychological areas, the action of morphine in this respect is much more powerful and the same is true of its analgesic effects. In fact papaverine, narcotine and also codeine to some extent, act more as excitants than depressants and this stimulant action, especially on the psychological areas, appears to be a prominent feature of *post*.

Within a few minutes after taking his potion the addict begins to show signs of ease, comfort and a general feeling of well-being. There must be some psychological element in this as the alkaloids would probably take 10 to 20 minutes at least to be absorbed from the gastro-intestinal tract into the circulation in sufficient quantities to produce their effects. There is undoubtedly a marvellous change in the addict soon after the potion is drunk. From a condition of lethargy, fretfulness, moroseness and peevishness, he passes into a state of gaiety and talkativeness. He looks happy, becomes very communicative and companionable. This state of affairs lasts for 1½ to 2 hours and gradually the agreeable feeling of elation

passes into a state of depression, the individual becoming drowsy, and he may fall off to sleep. The stage of depression is not nearly so marked as in the case of opium. The effects completely pass off in 5 to 8 hours. The excitement stage, we have already said, is more pronounced than with opium. The effect appears much more quickly, probably due to the fact that the alkaloids are taken in the form of solution and are absorbed more rapidly. When the habit has established itself for a long time the addict generally looks dull and sleepy, becomes slow of comprehension and inattentive. His gait becomes heavy, his movements slow; he is careless in dress and dirty in his habits. His speech is slow and hesitating, in monosyllables, jerky, and his voice is husky as if he is talking in his sleep. The only time when he brightens up and looks his normal self is when he has taken his potion, and for 2 or 3 hours afterwards. Even then his method of talking gives him away. He speaks as if in a dream; he pays little attention to what is said to him but goes on muttering to himself. Even small doses, e.g., 5 or 6 capsules a day, appear to produce a marked physical deterioration when continued for prolonged periods, and the addict becomes mentally degenerated and lazy. We found that even those addicts who took small doses could carry out their ordinary vocations only with difficulty.

The addicts say that poppy heads do not upset their digestion, in fact it is claimed that the appetite is sharpened and they can eat more and digest better. They claim that their eyes feel dry, the sight is improved, and cough and expectoration are decreased. It is said to dry all the excessive secretions. Some claim that it gives them relief from asthma. A drink of *post* in the evening after a hard day of toil refreshes them and gives them ease of mind and langour of the body.

Those addicted to this drug are generally believed to suffer from sluggishness of the bowels and chronic constipation. It is well known that morphine decreases general sensitiveness and, therefore, responsiveness to the defæcation act. The response to the distensive stimulus of peristalsis is decreased and there is quietening of peristaltic movements. Opium, therefore, gives rise to chronic constipation. The action of morphine esters, e.g., codeine, is less marked in this respect and that of narcotine and papaverine is even weaker. These latter alkaloids, however, have a direct, depressant action on the smooth muscle of the intestine and, therefore, tend to diminish peristalsis. The act of defæcation thus becomes difficult, so much so that the addicts sit for hours together and forget that they are in the act of defæcation.

The addicts are very forgetful not only of themselves but of their surroundings. They appear to lose all idea of correlation of

time and space; they forget their environment and do not know what they are engaged in doing. They may sit in one place for hours together doing nothing, without feeling it. They may walk a few yards and think that they have travelled for miles, or they may have walked for miles and think that they have walked only a few paces. They may go on doing hard work for hours without feeling it, or they may sit idle for long periods. They lose the idea of correlation of touch, perception and localisation and many stories are told about it. The addict to *post* becomes mechanical or automatic in his actions and appears to have no control over his will power.

Physical, mental and moral effects.—That addiction to poppy heads produces considerable physical, mental and moral degeneration, there is little doubt. Our impression from the study of our cases is that as compared with opium these effects are much more pronounced with much smaller quantities of the alkaloids which are contained in the poppy heads. The features we have described above are so typical of the addict that he can easily be recognised. While an opium addict taking small doses may not be easily differentiated from a normal individual, a person taking even small quantities of *post* at once gives himself away. So much so that in the Punjab a lazy, slovenly, dull and unintelligent looking person is often called a *posti* (or one who indulges in poppy capsules).

The addicts, who have taken the drug for some time, are as a rule spare and emaciated individuals with stunted growth and subnormal weight. They have a sallow, muddy appearance, sunken eyes and anæmic cheeks. Their eyes look dull and sleepy, they have heavy palpebræ and dry conjunctivæ. Advanced cases who have taken large doses look cachectic, have a dirty tongue, foul breath, and give the impression of suffering from chronic intestinal toxæmia. The subcutaneous fat is absent and the muscle tissue is wasted so much that the dry skin becomes quite loose over it. The throat is dry, respirations are slow and shallow and the expansion of the chest is impaired. The pulse at the wrist is weak, slow and compressible, soft hæmic murmurs are not unfrequently audible.

As regards the mental effects they differ somewhat from those of opium. The excitement stage is more prolonged on account of the smaller amount of morphine and larger quantities of the alkaloids of the iso-quinoline group, i.e., narcotine and papaverine. There is a feeling of elation, exuberance and well-being, which manifests itself in speech and gestures. In this stage the addicts become very communicative and reveal all their secret thoughts. There is loss of responsible control over mental processes, but the control of movements is not impaired as is the case with

alcohol. The net result of the action on the psychic areas is unrestrained imagination which may take different directions in different individuals. In some it will produce excitement, in others drowsiness and sleep. The irritation of the nerve cells produces hallucinations which, though present in this addiction, are not so prominent a feature as in the case of cocaine. The effect on the addict who has taken the drug for long periods resembles a chronic poisoning of the nervous system, especially of the higher psychical areas, which alters the mental activity from a state of high irritation to a complete breakdown even to paralysis. The addicts are generally feeble-minded individuals and are untruthful, selfish and self-centred.

Abstention symptoms.—These closely resemble those of opium. The effect of one dose of *post* lasts for 4 to 8 hours and it is generally so arranged that by that time the next dose is taken. Usually about half an hour before the due time the addict begins to yawn, feels dull, heavy, depressed and very tired. His eyes begin to run, there is sneezing, salivation and frequent spitting. Some have flatulence, eructations, and even pain in the abdomen. If a dose is not then taken, the fatigue increases, headache comes on, vague pains set in all over the body, which may localise themselves in some of the joints and may become excruciating. If still the dose is withheld the restlessness increases, the addict becomes very irritable and peevish; he becomes morose and despondent of his life; he has a sinking sensation and there may be a feeling of impending death. In some individuals the respiratory symptoms are more marked, the addict suffering from dyspnoea, and paroxysms of severe cough. In others the gastro-intestinal symptoms are prominent, there being frequency of stools, diarrhoea and colicky pain. In yet another group the nervous symptoms are the chief manifestations, the addict complaining of dimness of vision, formication, a tingling sensation over the body, and insomnia. As a rule the addicts are so careful of their next dose that they do not give an opportunity for these symptoms to arise, by making sure of it when it is due.

We have in another paper referred to a marked decrease in the opium habit in India since the advent of British rule, on account of the restrictions imposed on the production, possession and sale of the drug. Addiction to poppy capsules is another example. This habit which was once universally present among all sections of the population during the time of the Moghuls has now practically disappeared from British India, with the exception of a small area in the Punjab. The habit here has been so deeply rooted that total prohibition of cultivation of poppy heads would have led to acute distress among the population. The production is, therefore, being slowly decreased and the number of addicts is going down

rapidly. It is hoped that before long it will be entirely stopped and this pernicious drug habit will be a thing of the past.

SHORT TERM FEVERS IN THE PUNJAB.

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LATTERLY it has been one's privilege to spend the summer between three stations. Since a certain amount of resemblance is obvious between the types of fevers observed at each of these stations and the course run, the opportunity is here taken to record more typical cases from each of the stations with such explanatory notes as are considered necessary. The conclusions drawn at the end are ventured in the hope that they will receive the light of criticism by more capable workers.

The summer of 1929 in the Punjab generally was most unique in several ways. The heat was most oppressive until the outbreak of the monsoon, and record temperatures were recorded. The monsoon broke comparatively early and was characterised by little rain in the eastern districts of the Punjab, which are usually those most bountifully supplied and it spent itself on the south-western districts of the Punjab. Record floods in the western rivers of the Punjab occurred and of necessity there was a rise in the subsoil water level.

Cases 1 to 5 were observed at Ambala and relate to the period of summer before the onset of the rains. The surroundings were considered not at all favourable to the breeding of mosquitoes. On the other hand, with thatched roofing of the houses and matting, ideal surroundings for harbouring sand-flies were noticed. I may mention also that all these cases were taken from the same house.

Cases 6 and 7 were observed at Lahore at the time of the summer when the end of the monsoon had just set in. Even so, very few mosquitoes were noticed in the vicinity and those generally *Culicidæ*.

The last two cases in the list were observed at Campbellpore in the beginning of the winter. The place itself is well drained, and but few mosquitoes both of *culicine* and *anopheline* types were noticeable. Sand-flies are usually numerous but none were noticed in late November or early December when the cases occurred.

Case 1.—J., a boy aged 10 years, of delicate constitution. The fever was of sudden onset, with vague pains all over the body. At times he was flushed, at others the skin was cold with a fairly high temperature in the mouth. The throat was congested, but there were no other signs to be observed. The blood smear did not show malaria parasites. One dose of quinine, given on the fourth day, was held responsible for the rise of temperature to 103°F. on the following day, by his relatives. Convalescence was slow.

Case 2.—S(1), a girl aged 6 years. The onset was sudden, similar to, and three days after the onset in Case 1. She did not complain of any discomfort, but