

CASE SERIES AND REVIEW OF LITERATURE IN CUTANEOUS COMPLICATION OF PARENTERAL DRUG ABUSE

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ABSTRACT

Introduction: Parenteral drug abuse is commonly associated with varied vascular and cutaneous complications such as ulcers, abscess, vasculitis and cellulitis.

Materials and Methods: A series of six cases with complications of parenteral opioid abuse admitted in the Department of Psychiatry, Institute of Medical Sciences, Banaras Hindu University were studied and followed up.

Results: The subjects included five male and one female of the middle age group. All of them were previous heroine abusers who relapsed with parenteral abuse in the thigh region and calf. They were diagnosed with Ulcers, vasculitis and cellulitis and managed with debridement, excision and grafting.

Discussion: The drug abusers are seldom aware of the risks involved with the parenteral abuse of non-sterile preparations or injection sites and commonly present with vascular and cutaneous complications.

INTRODUCTION

Parenteral drug abuse is increasingly becoming a major health problem all over the world (Degenhardt *et al.*, 2017). It has been quite prevalent all over the world for the last several decades (Degenhardt *et al.*, 2017). However in India, the problem of drug abuse has emerged rapidly in the past few years (GOI, 2005; Kumar, 2004). Over the counter medicines are often abused as the drugs are easily available due to poor compliance of drug sale norms (Kumar, 2004). Pentazocine induced vascular and cutaneous complications were first described as early as 1971 (Young *et al.*, 1971). Varied complications; from thrombosed veins to large ulcers and venous aneurysms have been reported, which in turn can lead to numerous minor to life threatening and fatal complications (Warner *et al.*, 2004). These complications depend mainly on the drug, the dose injected, the method of delivery, the site of injection and the presence of infectious agents (Orangio *et al.*, 1983). In this article we will be describing a case series of cutaneous complications in subjects abusing parenteral opioids.

MATERIALS AND METHODS

The present study was conducted at the Institute of Medical Sciences, BHU, Varanasi. The institute is a tertiary care centre catering to a vast catchment area. The department of Psychiatry runs a special de-addiction clinic and has five bedded in patient set up for the addiction patients. The outpatients services in the hospital cater to referred and walk in subjects. The subjects discussed in this study were recruited from the de-addiction services. All the subjects were referred for opioid addiction after they had reported to the surgery, plastic surgery and dermatology clinics. None of the patients were self referred. Detailed examination and probing helped in establishing the diagnosis of parenteral opioid addiction. A written informed consent and permission to reproduce the images was sought from the subjects. The institute ethical committee approved the study. For brevity and comparison the cases are being presented in a tabular form. At intake the subjects were examined on a semi structured drug abuse screening proforma, a

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Table 1: Description of the subjects

Subjects/ Status of drug use	Age In Years	Sex/Occupation	Duration	Site of Injection	Presentation	Diagnosis	Management
1/Previous Heroin Abuser	33	Male/pharmacist	4-5 years	Lower Limb	Profuse bleeding from right groin and Hypotension	Femoral Artery Pseudoaneurysm	Primary debridement and repair of Pseudoaneurysm.
2/Previous Heroin abuser	26	Male/student	15 months	Lower Limb	Right leg pain and swelling along with a large subcutaneous ulcer	Cutaneous ulcer	Debridement and excision of slough, reconstruction of the wound area .Skin grafting done
3/Previous Heroin abuser	41	Male/auto driver	8 months	Various sites, Since 3 days thigh	pain, swelling ,ulcers upto foot with fever	Cellulitis with vasculitis	Debridement of wound, antibiotics and infection management
4/Previous Heroin abuser	33	Male/laboratory attendant	8 months	Upper Limbs	Swelling of right lower limb along with ulcers	Cutaneous ulcer with secondary infection	Medical Management
5/Previous Heroin abuser	37	Male/Medical shop owner	3 ½ Years	Upper and lower limbs	Fever and lower limb pain alongwith ulcers in the upper ,lower limbs and dorsum of palm	Cutaneous ulcers	Absconded before investigations and treatment could be started
6/Previous Heroin abuser	30	Female/mid wife	3 years	Calf	Right calf pain and swelling, Left lower limb pain	Right calf abscess Left lower limb veins swollen and tender. Vasculitis with abscess	Debridement and repaired with split skin graft, Anticoagulation therapy with Warfarin

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comprehensive history taking, physical examination and blood and urine examinations were undertaken. All the subjects were admitted but one patient absconded from the ward.

RESULTS

Of all the six cases taken, 5 were males giving a male to female ratio of 5:1. The age at presentation ranged between 25-41 years. All of them had previously completed rehabilitation for heroin abuse. Most of them presented with large, gaping ulcers filled with unhealthy granulation tissue. Almost all the subjects had ulcers either in the upper, lower or both limbs. The ulcers in all the cases were surrounded by indurated, hard skin. The veins were thrombosed, swollen and could not be located. Four out of the six cases injected the opioid in the ulcer itself, leading to large scale necrosis (Fig1, 3,4 and 5). Two of the subjects suffered from secondary infection in the ulcers (Fig 1, 3 and 4). Three of the subjects were managed surgically with debridement, excision or removal of slough, two were managed medically and one absconded before management could be initiated. All the subjects were medically managed for opioid addiction and after detoxification were given opioid antagonists before being discharged. Average length of stay ranged from three to four weeks. All the subjects underwent the routine and specific biochemical and relevant investigations. Investigation associated with AIDS, hepatitis B and Hepatitis C were undertaken. All the subjects underwent extensive non pharmacological management procedures like motivational enhancement, cognitive restructuring and supportive services. Table 1 highlights the details of all the subjects. The subjects were followed up and from the above series two subjects are maintaining abstinence, one died and one is lost to follow up, one has relapsed and seeking treatment in a private rehabilitation set up, the subject who had absconded did not report to treatment.

DISCUSSION

This case series is presented to highlight the serious cutaneous complications resulting from parenteral opioid abuse, and to heighten awareness of its devastating effects. Many common aspects are seen in our case series to the ones available in the literature (Kumar, 2004; Young *et.al.*, 1971; Warner *et.al.*, 2004; Orangio *et.al.*, 1983; Khanna *et.al.*, 2001). Male predominance is seen with the age group of 26-41 years (Kumar, 2004). The cases presented in the series had all completed successful rehabilitation for heroin abuse previously and had later on developed parenteral abuse. They all developed complications as a result of faulty and unsterile injection methods (Khanna *et.al.*, 2001; Del Giudice, 2004). The preferred site of injection was thigh, the female subject injected in the calf region. A wide range of complications can occur after parenteral abuse, depending on the site of injection (Redmond, 1979; Reyes, 1989). Complications seen in the present study were mainly cellulitis and non-healing wounds, which are commonly reported (Binswanger *et.al.*, 2000). Most common cutaneous complications are extensive fibrosis of soft-tissue with peripheral extension, though hyperpigmentation of ulcers, toxic epidermal necrolysis, and generalized erythema was also seen (Khanna *et.al.*, 2001; Del Giudice, 2004; Redmond, 1979; Reyes, 1989; Binswanger *et.al.*, 2000; Brown *et.al.*, 2002). Our series show a similar result to the one existing in terms of relapse and abstinence i.e. 30% abstinence and about the same rate of relapse (Degenhardt *et.al.*, 2017).

Possible mechanism suggested for such skin ulcers are acute followed by chronic inflammatory process after precipitation of the acidic drug in alkaline extracellular media (Roszier *et.al.*, 1989). In contrast to typical methods for injectable drug abuse like 'mainlining' or 'skin popping'; our patients used method midway between these two. In order to reach the inaccessible venous route, they used to inject in any approachable soft-tissue. The method is popularly known as 'blind dating' (Kumar, 2004; Brown *et.al.*, 2002). In this case series we did not ask for skin biopsy and urine drug estimation as the subjects were unwilling to give their consent. This is a possible lacuna which should be addressed in future discussions and this has been done in one study (Prasad *et.al.*, 2005).



Figure 1: Hyperpigmented ulcer



Figure 2: Vasculitis and cellulitis



Figure 3: Fibrosed, indurated swelling and ulcer



Figure 4: Puffy hand with ulcer



Figure 5: Cellulitis



Figure 6: Throbed Veins leading to swelling

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Review of Literature

Epidemiology: According to a recent review there were 15.6 million people who inject drugs (PWID) aged 15–64 years globally, with 3.2 million women and 12.5 million men. Globally, about 82.9% (76.6–88.9) of PWID mainly inject opioids and 33.0% (24.3–42.0) mainly inject stimulants. It is estimated that 27.9% (20.9–36.8) of PWID globally are younger than 25 years, 21.7% (15.8–27.9) had recently (within the past year) experienced homelessness or unstable housing, and 57.9% (50.5–65.2) had a history of incarceration (Degenhardt *et al.*, 2017; GOI, 2005). In 2005, the number of injecting drug users (IDUs) was around 189,729 back home (GOI, 2005). From 1998–2005 the estimated number of IDUs shall be between 300,000–2,025,000. IDU is prevalent in urban India, but there are also reports of IDU and heroin abuse in rural India (Degenhardt *et al.*, 2017; GOI, 2005).

Drugs used for abuse: The commonly used drugs for injection abuse are Heroin, Codeine, Morphine (Degenhardt *et al.*, 2017; GOI, 2005). In developing countries Pentazocine is also abused (GOI, 2005). Illicit drugs sold on the street are diluted several times to increase the profit margins of the dealers (GOI, 2005). Adulterating agents like Quinine, lactose, lidocaine, caffeine, inositol, dextrose, starch, and other miscellaneous substances are mixed in the form of a cocktail (Orangio *et al.*, 1983). Tablets are also crushed, dissolved and there after injected. Injection may also be prepared by mixing with water, lemon juice or other liquids (Orangio *et al.*, 1983). The method of preparation of the injections is unsterile and along with the sharing of syringes added to a lack of cutaneous antisepsis becomes the reason for secondary and other blood borne infections (Binswanger *et al.*, 2000).

Presentation. The usual injection route is intravenous and majority of addicts start injecting into cubital fossa but any vein can get involved including dorsa of hands, digits, feet, popliteal fossa, veins of neck, groins, penis (Young *et al.*, 1971). The femoral vein at the groin is a popular site due to its easy accessibility (Roszier *et al.*, 1989). In later stages when patients are not able to access the vein, drug may be injected into subcutaneous tissue (skin popping) or in the muscles (muscle popping) (Del Giudice, 2004). Some subjects start injecting into the subcutaneous tissue fairly early in the addiction to avoid prominent signs of repeated injections into veins which are called like “rail-road tracks” (Del Giudice, 2004).

Acute complications: Skin infections are among the most common complications of drug injection. Some diluents may produce anaerobic skin abscesses (Redmond, 1979). The skin flora is the likely contaminant of the infecting organism, as has been demonstrated by the microbiology of soft tissue infections, such as cellulitis and skin abscesses (Orangio *et al.*, 1983; Khanna *et al.*, 2001; Binswanger *et al.*, 2000). Beta hemolytic streptococci and Staphylococcus aureus account for the majority of microbial cases, although anaerobes predominate in some series (Orangio *et al.*, 1983; Prasad *et al.*, 2005). HIV infection is an independent risk factor for skin abscesses (Reyes, 1989). Factors increasing the vulnerability to infection include non-sterilized needles, tissue trauma, effects of the drug and its diluents and skin popping (Binswanger *et al.*, 2000; Brown *et al.*, 2002). Cutaneous necrosis and necrotizing ulcers may develop due to skin popping technique, or due to the irritant action of drug and adulterants, vascular thrombosis and infection may occur (Del Giudice, 2004).

Chronic Complications: Prolonged abuse of injectable drugs may cause many cutaneous signs which have diagnostic importance especially scars resulting from skin poppings are pathognomonic (Brown *et al.*, 2002). Multiple hyperpigmented punched out, atrophic scars of 0.3 to 5mm size are found usually at any accessible site (Redmond, 1979; Binswanger *et al.*, 2000). Repeated trauma to the veins may result in sclerosing effects and may lead to chronic venous insufficiency (Reyes, 1989; Binswanger *et al.*, 2000). Ulcers can appear at the site of previous sub cutaneous injection as a result of lymphatic and venous impairment (Binswanger *et al.*, 2000; Prasad *et al.*, 2005). Lesions may break down and ulcerate producing chronic ulcers (Roszier *et al.*, 1989).

With a brief overview of the literature it is important to raise awareness regarding a disfiguring and sometimes lethal complication of parenteral drug abuse.

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CONCLUSION

Clinicians should suspect parenteral opioid abuse when dealing with such typical indurated skin ulcers. Majority of the cases present in Surgery OPD as chronic cutaneous ulcers, subcutaneous abscess or pain due to the underlying thrombosis of veins. They might be easily missed if proper examination and history is not taken. The cases need a good liaison in the general hospital set up, as most of them have to be managed by debridement, excision and skin grafting. However the management is incomplete without de-addiction of the subjects for the drug abuse.

REFERENCES

- Binswanger IA, Kral AH, Blumenthal RN et al., (2000).** High prevalence of abscesses and cellulitis among community-recruited injection drug users in San Francisco. *Clinical Infectious Diseases*, **30** 579-81.
- Brown PD, Ebright JR (2002).** Skin and soft tissue infections in injection drug users. *Current Infectious Diseases Reports*, **4** 415-419.
- Degenhardt L, Peacock A, Colledge S, Leung J, Grebely J, Vickerman P, Stone J, Cunningham EB, Trickey A, Dumchev K, Lynskey M (2017).** Global prevalence of injecting drug use and sociodemographic characteristics and prevalence of HIV, HBV, and HCV in people who inject drugs: a multistage systematic review. *The Lancet Global Health*. **5**(12) e1192-207.
- Del Giudice P (2004).** Cutaneous complications of intravenous drug abuse. *British Journal of Dermatology* **150** 1-10.
- Khanna D, Drehmer TJ (2001).** Intravenous drug abuse mimicking vasculitis. *South Medicine Journal* **94**:505-7.
- Kumar S (2004).** India has widespread drug problem, report says. *British Medical Journal*. **329**:7456.
- Ministry of Health and Social Welfare (2005).** *Report to the Expert Group on Size Estimation of Population with High Risk Behavior for National Aids Control Programme/NACP-III Planning*, 2005-2006. Government of India.
- Orangio GR, Della Latta P, Marino C, et al., (1983).** Infection in parenteral drug abusers, further immunologic studies. *American Journal of Surgery* **146** 738-741.
- Prasad H R Y, Ramam M, Sharma V K, Pandhi R K et.al.(2005).** Diagnostic clinical features of pentazocine-induced ulcers. *International Journal of Dermatology* **44** (11) 910-5.
- Redmond WJ (1979).** Heroin adulterants and skin disease. *Archives Dermatol*, **115** 111.
- Reyes FA (1989).** Infections secondary to intravenous drug abuse. *Hand Clinics*, **5** 629-33.
- Roszier MH, McCrroll KA, Donovan KR et al (1989).** The groin hit: complications of intravenous drug abuse. *Radiographics*, **9**: 487-508.
- Warner RM, Srinivasan JR (2004).** Protean manifestations of intravenous drug abuse. *Surgeon*, **2** 137-40.
- Young AW, Rosenberg FR (1971).** Cutaneous stigmas of heroin addiction. *Archives Dermatology*, **104** 80-6