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Pain Perception and Pentazocine Abuse among Sickle Cell Anemia Patients: A Clinical Observational Study

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Abstract

This study examined pain perception and pentazocine abuse among sickle cell anemia patients. It was a clinical observational study of patients living with Sickle cell and abusing Pentazocine. The participants of this study involved 7 (5 males and 2 females) sickle cell inpatients between the ages of 19-32 years with a mean age of 25.3 and SD of 4.54, admitted in the inpatient facility of Federal Medical Center and Downtown Hospital, both in Umuahia, Abia State, Nigeria between 2019 to February 2022. The study adopted a qualitative design, and the result was analyzed using thematic analysis. The findings of the thematic analysis presented respondents' reasons for abuse of Pentazocine. All the patients reported that they initially received Pentazocine from their healthcare practitioners as a potent medication for pain relief due to the frequent pain crisis accompanying their health condition. Over time, they perceived Pentazocine as the only medication to soothe their pains. The result also showed that the patients developed a psychological dependence on Pentazocine. All the patients agreed that over time, they were not using it when they have pain, but the fear of pain crisis, cravings, and calmness they experienced when they used Pentazocine led to frequent use and abuse. Hence, the study concludes that actual pain crisis was not the reason for pentazocine abuse among patients living with sickle cell anemia. Still, the psychological perception of pain and subsequent rewards led to abuse. The findings have implications for doctors treating sickle cell patients to reduce the use of Pentazocine as a pain-relieving drug. It also has implications for policymakers to involve clinical psychologists in treatment protocols of individuals living with sickle cell to check and assess their mental and emotional state regarding their health and treatments.

Keywords: Pentazocine; Sickle Cell Disease

Abbreviations: SCD: Sickle Cell Disease.

Introduction

Sickle cell disease (SCD) is an inherited hemoglobinopathy disease and is the most common genetic hematologic disorder in Nigeria [1]. About 3% of children in Nigeria are born with this inherited red blood cell disease which affects individuals born with two 'S' hemoglobin. This disorder is associated with 'crisis,' which are painful vaso-occlusive and anemic episodes, often affecting the hands, legs, chest, back, abdomen, and most times necessitates treatments with

opioid/analgesics, such as pentazocine and hospitalization. In addition, studies have shown that the prolonged use of pentazocine in the pain management of sickle cell disease (SCD) may lead to both physical and mental dependence [2-4].

Although pentazocine is a controlled drug, and legislative policies in Nigeria control its access, the ineffective distribution of this drug from the manufacturers to the final consumers may have aided the proliferation and misuse of this psychotropic substance. Due to the analgesic and euphoric effect of pentazocine, it has become the most used opioid in managing mild to severe painful crises of sickle cell disease in Nigeria. There is a growing concern on the topic of self-medication, misuse, and addiction to pentazocine by individuals (even in children) suffering from pain due to sickle cell disease (SCD) [3]. This trend of misuse has been opined to lead to dependence, with the consequences of long-term rehabilitative care. Despite its reported analgesic and euphoric effect and its ability to 'stop' pain and produce some calming or relaxation effect, its propensity to lead to addiction, and the pervasiveness of social, economic, medical, psychological, and physical costs of pentazocine misuse, has also been reported Akinsegun, et al. [3], Anazoeze, et al. [5]. The medical cost, such as the increased risk of contracting HIV infection and hepatitis, because of the improper use of unsterile equipment, such as syringes and needles, have not seemed to discourage the abuse of pentazocine by some individuals who have sickle cell disease [6]. Some of the complications of pentazocine abuse may include skin fibrosis, skin ulceration, abnormal skin pigmentation, symmetrical myopathy, and fibrous myopathy.

Pain perception can be described as a sensitivity to acute and unpleasant sensory, emotional, or physiological discomfort, often evoked by stimuli such as a disease, injury, or harm. Nociception refers to an individual's perception of a painful stimulus, measured in intensity, degree, or frequency. This process activates a series of molecular physiological processes in an organism, thereby triggering protective responses/behaviors.

Madu, et al. [5], in their survey study on Pentazocine Addiction and Opioid Use in Adult Sickle Cell Anaemia Patients, reported a high prevalence rate of pentazocine addiction among sickle cell patients. They also reported that most doctors have often warned sickle cell patients about the dangers of pentazocine addiction. In another Nigerian study by Akinbami, et al. [3], which aimed to investigate the occurrence of pentazocine addiction among SCD patients and healthcare workers' perception of pentazocine usage, 350 SCD participants (48.3% males and 51.7% females) who were patients with the Lagos State University Teaching Hospital sickle cell clinic, were employed. Extracted questions from the World Health Organization's (WHO) ASSIST questionnaire, used to examine addiction to psychotropic substances, were utilized. Results from the study suggest that although most SCD patients had never used pentazocine (78%), 15.1% had used it in the past, indicating a prevalence of pentazocine misuse among sickle cell patients. Data from the study also showed that about 96.9% of the participants feel pentazocine usage has not affected their health, social, legal, or financial functioning.

A case report study by Armiya'u, et al. [4] observed the presentation of pentazocine dependence with mild depression in a 17-year-old sickle cell anemia patient. In addition, the patient had an 18 months history of pentazocine abuse (6 months' excessive usage) as the sequel to a bone pain crisis. This study reveals an association between sickle cell disease, pentazocine abuse, and possible psychiatric implications in SCD patients.

In another case report by Yelne, et al. on a necrotizing lesion due to pentazocine injection abuse in a 48-year-old male, the case reported vascular and soft tissue damage, which manifested in infection with fluid oozing out, and a necrotized lesion as an adverse effect of the frequent abuse of pentazocine. A physician earlier prescribed the drug for pain management, but the patient continued self-medicating after the initial treatment.

Zanzmera, et al. also studied the case of a 33-year-old male presenting pentazocine-induced myelofibrosis (a calcification of skin tissues). The observed patient presented hard and thickened muscles not localized at the area where pentazocine was injected. He presented with about ten years of pentazocine abuse of about two ampules daily, resulting in acute withdrawal symptoms without the drugs. Gait, posture, and movement were markedly affected. The exact modal of operation of pentazocine abuse, as regards this rare complication, has not yet been identified. This implies that the antagonistic effect of pentazocine on human physiological and psychological well-being may be more harmful than what studies have presently portrayed.

Oluomachi, et al. [6], in their study on pentazocine misuse among sickle cell disease patients, reported that most participants (71.4%) had self-administered pentazocine for more than 2years. About 52% of patients took pentazocine daily, and 14% took as much as 150mg per time. Knowledge of self-medication was first acquired at home through a nearby health worker/parent, 42.8%, while 33.3% and 19% were through treatment from a pharmacy/ chemist shop and fellow friends living with sickle cell, respectively. All of them reported procuring pentazocine without a prescription from pharmacy outlets (57.1%), chemists (14.2%), and

open markets (9.5%). Their study went on to report factors necessitating and sustaining pentazocine misuse as unhindered access to pentazocine, lack of finance to visit the hospital when in crisis, and encouragement by a fellow SCD patient who is already abusing pentazocine.

Pentazocine abuse/misuse has been reported to be a significant cause of concern to researchers and healthcare professionals. However, despite local and global studies (especially in Nigeria and India) on the associated physiological implications of pentazocine abuse among SCD patients, few studies have explored the psychological concomitant that may necessitate and sustain pentazocine abuse among SCD patients.

Aims of the Study

This study seeks to close the gap in knowledge by exploring the perception of pain, implications, and experiences by SCD patients (including psychological factors) as it relates to pentazocine abuse.

Theoretical background

(Exploring theoretical models in explaining substance (pentazocine) abuse)

Negative Reinforcement (Operant Conditioning)

Operant conditioning is a theory of learning propounded by B.F Skinner in 1937. This term was coined to describe behaviors that are "controlled" by their consequences. In operant conditioning theory, individuals are likely to engage in pleasant behaviors, and behaviors with adverse consequences are not likely to be engaged in. This invariably means that the consequences of the behavior determine the probability or likelihood of the said behavior being repeated in the future. In operant conditioning, concepts such as positive reinforcement, negative reinforcement, punishment, and schedules of reinforcements, are used to explain human behavior through the prism of actions and their consequences. Reinforcements are negative or positive responses/feedback an individual gets, which can be physiologically or from his environment, that either weakens or strengthens the probability of the initial behavior being repeated.

The premise of the theory of negative reinforcement is that behaviors are strengthened when unpleasant stimuli are removed. In explaining this concept as it relates to pentazocine misuse in pain management among sickle cell patients, the perception of pain is the unpleasant/painful stimuli the patient seeks to remove by injecting pentazocine (an opioid). The rewarding effect of reduced/eliminated pain and the experienced feeling of euphoria strengthens the likelihood that the said behavior (pentazocine misuse) will be repeated.

Methods

Study Participants

The participants of this study involved 7 (5 males and 2 females) sickle cell inpatients between the ages of 19-32 years with a mean age of 25.3 and SD of 4.54, admitted in the inpatient facility of Federal Medical Center and Downtown Hospital, both in Umuahia, Abia State, Nigeria between 2019 to February 2022. On admission, they were diagnosed with stimulant use abuse (Pentazocine) based on toxicology test outcome. Most participants were within the secondary school education level (57.1%), 42.9% of them had a history of pentazocine misuse for 2 years and above, and 57.1% of them reported using 31-40amp of pentazocine intravenously per day.

Instrument

The self-report in-depth interview method, where the patient gave first-hand information about their Pentazocine drug abuse, was employed for data collection.

Study Procedure

Approval to carry out this study was obtained from the management of the hospitals used. Thus, after initial detoxification, the patients were briefed about the aim of the study, and their informed consent was sought and obtained. Rapport was created, and other ethical considerations such as confidentiality and anonymity were ensured and maintained. An In-depth Psychological Assessment of the patients was made. In subsequent sessions (45 minutes each), in-depth interviews were done to ascertain their perception of pain and Pentazocine misuse. The interview and assessment of their Pentazocine misuse were done in 8 sessions (one session per week) for each patient, and it lasted 2 months. Information obtained from the in-depth interview was organized for analysis.

Study Design and Statistics

The study adopted a case study design, and thematic analysis was used to present and analyze the data collected.

Results

The Table 1 shows that majority of the respondents are males (71.4%) with secondary school education level (57.1%) and have used between 31-40amp of pentazocine daily (57.1%) for 24 months and above (42.9%).

Variables	Percentage	Mean	SD
Gender	Male – 71.4	1.3	0.49
	Female – 28.6		
Age		25.3	4.5
Edu Level	Secondary School – 57.1		
	Undergraduate – 14.3	2.7	0.95
	Graduate – 28.6		
Years of Pentazocine Misuse	1-11 months – 28.6		
	12-24 months – 28.6	6.1	0.9
	24 months and above – 42.9		
Strength of Use per day	20-30amp – 42.9	1.6	0.54
	31-40amp – 57.1		

Table 1: Summary of the descriptive statistics showing the frequency, mean and standard deviation of the respondents' demographic variables.

Respondents' Pentazocine Abuse and Pain Perception

Pain Perception and Pentazocine Abuse were sought from the participants used for this study, and five themes were developed from their responses, as shown in Table 2.

Categories of Findings	Themes	No of persons
Perception for Abuse	pain relieve	7
	Craving	7
	Fear of Pain	7
	Calmness of the body	7
	Ecstasy	3
Means of administering pentazocine	Intravenously (self-administered)	7
Means of acquiring pentazocine	Local pharmacies	7

Table 2: Summary of the study findings.

From the responses in Table 2 above, all the respondents reported that they initially received Pentazocine from their healthcare practitioners as a potent medication for pain relief due to frequent pain crises accompanying their health condition. Over time, they perceived Pentazocine as the only medication to soothe their pains. For instance, when asked, "How do you view Pentazocine? They all replied that it was seen as a powerful medication that can stop pain crises". Thus, they became dependent on the medication and administered it intravenously independently because of their perceived pain crisis and pentazocine effects (pain control).

All the patients admitted that over time, they started craving it. When asked, "How do you feel when you have not taken Pentazocine? One said, " I always feel so restless and unable to concentrate until I take it." The other said, "It feels like something was missing, and I need to fix it."

All participants also admitted that they were no longer taking Pentazocine because of the presence of pain crisis, but the fear of having pain led to constant injecting of Pentazocine. When asked, did you have to take the injection because of having pain? One said, "I was virtually taking it daily, even when the pain was not there." Another said, I always imagine how painful the crisis uses to be, so the fear of experiencing the pain in a real sense led to my constantly injecting".

Three out of seven of them claimed that they did not know the addictive components of Pentazocine. However, they acknowledged a euphoric feeling associated with injecting Pentazocine that led to the use of it even when the said crisis was not present (Addiction). For example, one of them, when asked if they knew that Pentazocine could be addictive, Said, "I did not know initially, but all I knew was the feeling of highness and happiness I usually have any time I inject it." While four reported that their doctors and pharmacists informed them about the addictive components of Pentazocine, the cravings and fear of pain crisis were their barriers. All reported that they were no longer using it when they had a pain crisis but have become habitual users and gradually increased their dosage beyond hospital recommendations. Indicating psychological feelings as factors necessitating and sustaining Pentazocine abuse by respondents.

Their Pentazocine strength of use before was 5 or 10amp when they had pain, but they increased to 20 -40amp. Their

habitual and frequency of use increased from once daily twice to three times daily. Over time, a greater amp of Pentazocine was required to achieve calmness, avoid perceived pain, and maintain cravings, not for an actual pain crisis.

The constant intake of Pentazocine led to perceiving it as the most efficacious pain-relieving analgesic. They perceived other analgesics such as ibuprofen, Paracetamol, Panadol, piroxicam, diclofenac, and other analgesics as ineffective in alleviating their pain.

They all reported sourcing pentazocine injections from local pharmacies and patent medicine shops without prescriptions or with old prescriptions, as some of the local pharmacies already know them as sickle cell patients.

Discussion

This study investigated pain perception and pentazocine addiction among 7 sickle cell inpatients admitted to the Federal Medical Center and Downtown Hospital inpatient in Umuahia, Abia State, Nigeria, between 2019 to February 2022. Five themes were developed from the responses obtained, as shown in Table 2 above.

The first theme showed that all the respondents received Pentazocine for pain control. When asked about the reason behind their pentazocine intake, all respondents reported that they initially received Pentazocine as a potent medication for pain relief for their health condition by their doctors (pain control). Thus, they perceived Pentazocine as the only medication to soothe their pains and became dependent on it. For instance, when asked, "How do you view Pentazocine? They all replied that it was seen as a powerful medication that can stop pain crises". Thus, they became dependent on the medication and administered it intravenously independently because of their perceived pain crisis and pentazocine effects (pain control). This finding is supported by the Adewoyin, et al. [2] study that reported Pentazocine as one of the common opioids in treating pain crises, including sickle cell disease pain. For the second and third themes, all the patients admitted that over time, they started craving it because of the calmness associated with taking it. When asked, "How do you feel when you have not taken Pentazocine? One said, "I always feel so restless and inability to concentrate until I take it." The other said, "It feels like something was missing, and I need to fix it." These findings are supported by Madu, et al. [8] survey on Pentazocine Addiction and Opioid Use in Adult Sickle Cell Anaemia Patients, who reported a high prevalence rate of Pentazocine addiction among sickle cell patients. The fourth theme revealed that all of the participants also admitted that they were no longer taking Pentazocine because of a pain crisis, but the fear of having pain led to the constant injecting of Pentazocine. When asked, did you have to take the injection because of having pain? One said, "I was virtually taking it every day, even when the pain was not there." Another said, I always imagine how painful the crisis use to be, so the fear of experiencing the pain in a real sense led to my constant injecting." The present findings indicated that all participants were using Pentazocine for psychological feel and cravings. For the fifth theme, three out of seven respondents acknowledged a euphoric feeling associated with injecting Pentazocine that led to the use of it even when the said crisis was not present (Addiction). However, they claimed they did not know the addictive components of Pentazocine. For example, one of them, when asked if they knew that Pentazocine could be addictive, said that he did not know initially. However, all he knew was the feeling of highness and happiness he usually had whenever he injected it. While four reported that their doctors and pharmacists informed them about the addictive components of Pentazocine, the cravings and fear of pain crisis were their barriers. This was supported by Akinsegun A, et al. [3], whose study on pentazocine addiction reported that the intake of Pentazocine could bring about a euphoric effect that could stop the pain and produce a calming or relaxed mood which could lead to addiction. All the respondents reported that they were no longer using it when they had a pain crisis but have become habitual users and gradually increased their dosage beyond hospital recommendations. Their Pentazocine strength of use before was 5 or 10amp when they had pain, but they increased to 20-40amp. Their habitual and frequency of use increased from once daily twice to three times daily. Over time, a greater amp of Pentazocine was required to achieve calmness, avoid pain, and maintain cravings, not for an actual pain crisis. The constant intake of Pentazocine led to perceiving it as the most efficacious pain-relieving analgesic. They perceived other analgesics such as ibuprofen, Paracetamol, Panadol, piroxicam, diclofenac, and other analgesics as ineffective in alleviating their pain. The explanation for these findings cannot be farfetched! Since the respondents perceive Pentazocine to be very effective in controlling the pains associated with their health condition, being dependent on it becomes easier as they can quickly source the medication from local pharmacies and patent medicine shops without prescription as some of these drug stores already know them as sickle cell patients and thus do not need doctor's prescription to sell to them.

Implications

The result of this study showed that there is high abuse of Pentazocine among sickle cell patients. It also implies that they no longer use Pentazocine for clinical purposes but for euphoric feelings and cravings. Thus, they need to regulate the availability and accessibility of Pentazocine strictly.

Conclusion and Recommendations

The study examined Pain perception and Pentazocine abuse among sickle cell anemia patients. It adopted an in-depth interview to assess the psychological factors that necessitated and sustained the continuous use of Pentazocine even when the actual pain crisis was not present. Findings showed that all participants abusing Pentazocine were used when the pain was not there. As a result, craving and psychological perception of pain. Although there is a dart of research on the psychological perception of pain and the use of Pentazocine, previous studies support the frequent use of Pentazocine as a pain reliever and subsequent abuse (self-administration). Studies have shown that the prolonged use of Pentazocine in pain management of sickle cell disease (SCD) may lead to physical and mental dependence [2-5,8]. This psychological dependency supports the present study. The present study's findings showed that it was not the actual pain that necessitated and sustained Pentazocine abuse but the psychological feeling of pain and a subsequent craving for the substance.

Therefore, this study recommends a holistic substance abuse intervention strategy. But, more importantly, substance prevention programs should be implemented across all strata of Nigerian society, starting from the federal, regional, state, and community levels.

Limitations

The study sample size was tiny because it was not done in a sickle cell hospital but in a rehab center.

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