

# The Prevalence of Marijuana Smoking in Young Adults with Sickle Cell Disease A Longitudinal Study

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## ABSTRACT

**Background:** The active ingredients of marijuana may have beneficial properties in the treatment of chronic pain and inflammation and is being used by sufferers of chronic pain and arthritis in some settings. Anecdotally, marijuana is believed by some sickle cell disease (SCD) patients to improve their health. This study aimed to determine the prevalence of marijuana smoking in the Jamaica Sickle Cell Cohort Study (JSCCS) in the years 2000 and 2004. The perception that marijuana use ameliorated the complications of SCD was also investigated.

**Methods:** All patients in the JSCCS were invited to attend an annual review, and during the 2000 and 2004 reviews, participants with homozygous sickle cell (SS) disease and sickle cell haemoglobin-C (SC) disease were asked whether they smoked marijuana, and if they smoked, whether it was used for medicinal purposes related to SCD. The authors compared smoking prevalence by gender, disease, and year of review. The association of smoking with a measure of pain frequency was also examined.

**Results:** The prevalence of marijuana smoking was higher among men and among SC participants. The proportion of either gender reporting smoking of marijuana increased in 2004 compared to 2000, and this use was not related to a simple measure of clinical severity of SCD.

**Conclusions:** Marijuana smoking is common in adults with SCD but its usage is unrelated to clinical severity of the disease.

# Prevalencia del Hábito de Fumar Marihuana en los Adultos Jóvenes con Enfermedad de Células Falciforme Un Estudio Longitudinal

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## RESUMEN

**Antecedentes:** Los ingredientes de la marihuana pueden tener propiedades beneficiosas para el tratamiento del dolor e inflamación crónicos, y en algunos lugares esta planta está siendo usada por enfermos que sufren de dolor y artritis de manera crónica. De forma anecdótica, se dice que algunos pacientes de la enfermedad de células falciformes (ECF) creen que la marihuana les mejora la salud. Este estudio se propuso determinar la prevalencia del hábito de fumar marihuana en el Estudio de Cohorte Jamaicano de Células Falciformes (ECJCF) en los años 2000 y 2004. Los autores también examinaron la creencia de que el uso de la marihuana guarda relación con la percepción de que la misma mejora los casos con complicaciones por ECF.

**Métodos:** A todos los pacientes en el ECJCF, se les invita a asistir a un examen anual, y durante los exámenes de los años 2000 y 2004, a los participantes con enfermedad de célula falciforme homocigótica (SS) y con la enfermedad de célula falciforme hemoglobina C (SC), se les preguntó si fumaban marihuana, y si la usaban con fines medicinales en relación con la ECF. Los autores compararon la prevalencia por género, enfermedad, y año de examen. Asimismo, examinaron la asociación del hábito de fumar marihuana con una medida de frecuencia de dolor.

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**Resultados.** La prevalencia del hábito de fumar marihuana fue más alta entre los hombres y entre los participantes SC. La proporción de ambos géneros que reportó hábito de fumar, aumentó en el año 2004 en comparación con el año 2000, y el uso de la marihuana no estuvo relacionado con una simple medida debida a la gravedad de la ECF.

**Conclusiones.** El hábito de fumar marihuana es común en adultos con ECF, pero su uso no guarda relación con la gravedad de la enfermedad.

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**INTRODUCTION**

Marijuana smoking is relatively common in Jamaica with as many as 10–15% of adult women and 37–49% of adult men having smoked marijuana at some time in their life (1, 2). The active ingredients of marijuana, in particular the cannabinoids, may have beneficial properties in the treatment of chronic pain (3–5) and inflammation (3) and, in some settings, is being used by sufferers of chronic pain (6,7) and arthritis. Marijuana may be useful in the treatment of sickle cell disease (SCD). Anecdotally, marijuana is believed by some SCD patients to improve their health. This study aimed to determine the prevalence of marijuana smoking in the Jamaica Sickle Cell Cohort Study (JSCCS) (8) in the year 2000 and whether it remained unchanged four years later. The authors also examined whether marijuana smoking among patients with SCD was related to a simple measure of painful crisis frequency and to the perception that it ameliorated complications of SCD.

**SUBJECTS AND METHODS**

The JSCCS incorporated all patients with SCD detected during the screening of 100 000 consecutive deliveries at the main Government Maternity Hospital from June 1973 to December 1981. These patients have been followed at the Sickle Cell Unit since birth. All JSCCS participants who have not migrated or died were asked to attend an annual review during a three week window beginning on the last Monday in January. During reviews in 2000 and 2004 homozygous SS disease (SS) and sickle cell haemoglobin-C disease (SC) participants were asked whether they had ever smoked marijuana. Additionally, in 2000, participants were asked whether they currently smoked marijuana, and in 2004 they were asked whether they had smoked marijuana in the preceding 12 months. Marijuana smokers were asked whether they used it for SCD complications and if so, the specific complications for which they used marijuana. The project was reviewed and approved by the University of the West Indies/Faculty of Medical Sciences/ University Hospital of the West Indies Ethical Committee. Written, informed consent was obtained from the subjects prior to participation in the study.

**Statistics**

The authors calculated the prevalence of smoking by gender and by genotype separately for each year of the study. They calculated the change in prevalence between 2000 and 2004 after adjusting for the possible confounding effects of age

and gender. They also explored the association of sickle cell related pain and the prevalence of marijuana smoking using the number of independent episodes of dactylitis and uncomplicated pain crisis events requiring opioids, and occurring at least seven days after an initial event. This summary measure of pain was introduced to the logistic regression model, after adjusting for age, gender, and year of study. Stata 8 was used for all analyses (StataCorp, College Station, TX).

**RESULTS**

**Response rate**

The number of available participants fell between 2000 and 2004, mainly due to death and migration (Fig. 1). Among

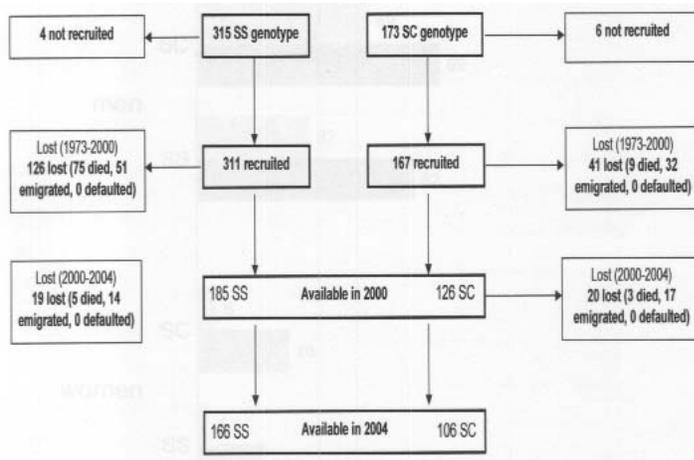


Fig. 1: Flow chart depicting the recruitment of study participants with homozygous sickle cell disease or SC disease.

available patients, the response rate in 2000 was about 90% for all genotype/sex combinations (Table). The non-res-

Table: Number and percentage of available participants responding to questions on marijuana use in 2000 and 2004

| Pattern of response         | SS disease |         | SC disease |         |
|-----------------------------|------------|---------|------------|---------|
|                             | Women (%)  | Men (%) | Women (%)  | Men (%) |
| Responding in 2000          | 85 (94)    | 90 (91) | 54 (89)    | 59 (88) |
| Responding in 2004          | 78 (88)    | 71 (73) | 46 (77)    | 39 (58) |
| Responding in 2000 only     | 10         | 20      | 9          | 23      |
| Responding in 2004 only     | 3          | 1       | 1          | 3       |
| Responding in 2000 and 2004 | 75         | 70      | 45         | 36      |

ponders reflected a small subgroup of chronic defaulters. The response rate in 2004 was slightly lower, especially among

men with haemoglobin SC disease. The increased non-response reflected participants who were usually asymptomatic and were therefore less inclined to visit the sickle cell clinic. The mean age of the study sample was 22.6 (range 18.1 to 26.6 years) in 2000 and 26.6 (range 22.1 to 30.6 years) in 2004.

### Smoking prevalence

After controlling for the possible influence of age on the decision to smoke marijuana, use of smoked marijuana was higher among men and among SC participants, and the proportion of either gender reporting smoking increased in 2004 compared to 2000 (Fig. 2). In 2000, the odds of smok-

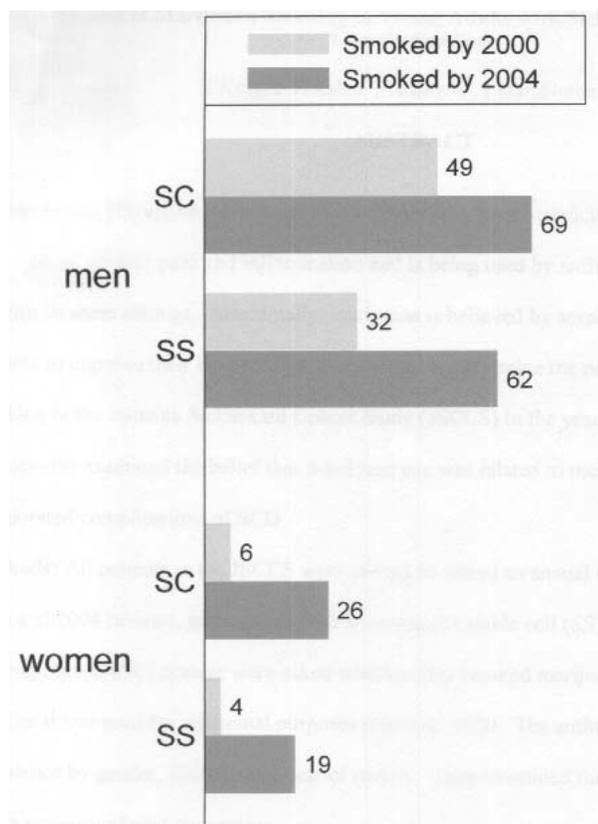


Fig. 2: Percentage of available respondents who report ever smoking marijuana by 2000 and 2004.

ing were 14.7 times higher among men than women (95% CI 6.0, 35.7) and were 1.9 times higher among SC than among SS participants (95% CI 1.0, 3.5). In 2004, the odds of smoking had fallen to 6.6 times higher among men (95% confidence interval 3.7, 11.9) and were 1.5 times higher among SC participants (95% CI 0.8, 2.7). The use of marijuana had increased more among women by 2004. After adjusting for age and genotype, the odds of reporting smoking among women in 2004 vs 2000 were 5.4 (95% CI 2.1, 13.6), and among men were 3.8 (CI 2.1, 6.7). Of those SC participants who responded in 2000, 67% of those that did not smoke and 55% of those who did smoke were available for survey in 2004. Equivalent figures for SS participants were 84% and

66% respectively. Of those who admitted to smoking marijuana in 2004, and had attended both reviews, 58% began smoking marijuana between 2000 and 2004. Of those who reported in the 2004 survey that they had smoked marijuana, eleven (6.3%) stated that they had used marijuana because of complications of SCD. Seven patients cited painful crises while one person each identified depression, asthma and poor weight gain as the indications for marijuana use. One patient stated that marijuana was used to treat SCD but was unable to name a specific complication. There was no suggestion that smokers and non-smokers had different pain profiles: the odds of smoking did not increase with increasing pain in either 2000 (OR = 0.95, 95% CI 0.86, 1.04), or in 2004 (OR = 1.02, 95% CI 0.94, 1.11). There was little difference between smokers and non-smokers in the median number of pain events in either 2000 or 2004. By 2000 smokers and non-smokers had on average one event (interquartile range: 0–3), and by 2004 non-smokers had a single event and smokers had two events (interquartile range: 0–3 in both cases).

### DISCUSSION

This study of marijuana smoking behaviour over a four-year period from 2000 to 2004 in young adults with SCD demonstrated that marijuana use was fairly common and increased between the two surveys: the prevalence of a history of smoking marijuana in women rose from 4.6% to 19.4% and in men from 38.3% to 64.6%. A population based probability sample comprised 958 Jamaicans aged 15 to 49 years and estimated the prevalence of a history of smoking marijuana to be 10% in women and 37% in men (1). In 2000, a survey of high risk health behaviours among a nationally representative sample of Jamaican adults reported that 15% of the women and 49% of the men had a history of smoking marijuana (2). The estimate reported here, particularly for men, was higher than the estimates of the prevalence of a history of smoking marijuana in the general population. This may have been due to a change in behaviour in Jamaica over time, a real difference in the prevalence of marijuana smoking in patients with SCD compared to the general population or to the difference in the ages in the reports. The possibility that this difference in reported prevalence estimates may have been due to a change in behaviour over time was supported by the reported increase in the use of marijuana over the four-year period of this study. The change in the prevalence of smoking was not due to a difference in attendance in non-smokers and smokers as 83% of non-smokers and 63% of smokers who came to the 2000 review returned in 2004. This would have tended to decrease the proportion of smokers in 2004 if the patients' behaviours were unchanged. The difference in reported prevalence estimates was unlikely to be due to the presence of SCD as few (6%) of SCD patients related their usage of marijuana to their disease, and more patients with SC disease, a milder form of the disease, used marijuana than did patients with SS disease. The higher

estimate in this study also suggests that under-reporting may not be a major source of bias.

A weakness of this study is the limitation of inquiry to smoking behaviour, as marijuana is also used in other forms, particularly as a tea. The study did not collect data to assess whether there was a possible link between amount and frequency of marijuana use (dosage), and the amelioration of complications of SCD (risk response), future studies should pursue these. The decrease in the absolute numbers of subjects in attendance between the two surveys is an almost inevitable phenomenon in long-standing cohort studies, as persons die or emigrate, but the percentage of eligible patients attending was relatively high, suggesting that this report may be representative of the sickle cell disease population nationally.

The importance of these data relate to the possible therapeutic use of marijuana in SCD. Extracts of the *Cannabis sativa* (marijuana) have been used successfully to treat a myriad of disorders. The use in the treatment of glaucoma was pioneered in Jamaica (9, 10), with the licensing of Canasol and subsequently, in combination with Timolol, Catimol, has become used internationally. Other accepted clinical indications for the use of cannabinoids include vomiting in association with cancer chemotherapy and anorexia associated with HIV wasting disease (11). Perhaps most relevant to the treatment of SCD are recently published data suggesting the usefulness of cannabinoids in the treatment of chronic pain (5), though not neuropathic pain (12). There are no data concerning the usefulness of cannabinoids in SCD but it has been suggested in the literature that trials may be considered in the near future (13). However, before introducing a drug, it is useful to determine whether individuals have previously or are currently being exposed to the drug. These data suggest that a significant proportion of

SCD patients in Jamaica have been exposed to marijuana, but that the usage has not been for SCD related morbidity in most cases. Such data should be sought in any population prior to the trial or introduction of therapeutic cannabinoids.

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