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Whoonga: Potential recreational use of HIV antiretroviral medication in South Africa

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Abstract

Whoonga is a drug cocktail in South Africa rumored to contain illicit drugs and HIV antiretroviral (ARV) medication. Although its use may adversely impact adherence to HIV treatment and may have the potential to generate ARV resistance, there is a paucity of research characterizing whoonga. We learned of whoonga during semi-structured interviews about substance abuse and HIV risk at “club-events” known as *inkwaris* in an urban township of Durban, South Africa. Whoonga was an emerging theme spontaneously identified as a problem for the community by 17 out of 22 informants. Perceptions of whoonga suggest that it is highly addictive, contains ARVs (notably efavirenz), is used by individuals as young as 14, and poses a threat to the health and safety of those who use it, including increasing the risk of HIV infection. Our informants provide preliminary evidence of the dangers of whoonga and reinforce the need for further study.

Keywords

Recreational HIV antiretroviral use; Substance abuse; South Africa; Whoonga and nyaope; Antiretroviral diversion

Introduction

With increasing access to HIV antiretroviral (ARV) medication, there has also been increasing attention to the patient and programmatic factors that encumber the response to the HIV/AIDS pandemic. One such factor is substance abuse. Individuals with alcohol and

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drug abuse are at increased risk of HIV infection, are less likely to access treatment services, are more likely to have suboptimal adherence to ARV treatment, and suffer poorer HIV-related health outcomes [1-6].

The diversion of medication used in the treatment of HIV-infected individuals is also problematic as it drives up costs, contributes to supply and adherence problems, and may be associated with criminal activity which endangers patients, healthcare staff, and clinics [7, 8]. Diversion is most commonly associated with the extramedical use of non-ARV medications prescribed to HIV patients, for example, analgesic or opiate medication, androgenic steroids or human growth hormone, medications for erectile dysfunction, psychotropic medication such as benzodiazepines, and/or dronabinol [7, 8]. ARVs, however, may also be diverted. For example, HIV-infected individuals may self-treat outside of formal care networks with ARVs prescribed to HIV-infected family members or those obtained illegally from “black market” sources [9]. Under these circumstances, would-be patients often do not follow appropriate treatment regimens. ARVs may also be diverted for “alternative” use, such as combivir for “breast enhancement” described in Nigeria [10]. These forms of ARV misuse have been linked to the development of ARV resistance [9, 10].

ARVs are also being diverted because some individuals use them recreationally. In focus group discussions and interviews about prescription drug diversion with HIV-infected patients in Miami, Florida, USA who abused and/or diverted drugs, informants describe how protease inhibitors, most notably ritonavir, enhance or prolong the effects of ecstasy and methamphetamine and are sold with illicit drugs as “cocktails”. Additionally, they claim that efavirenz can be “intoxicating,” and it is used independent of illicit drugs for its psychoactive effects [7].

The only other reports of recreational ARV use are from South Africa. Reports in the news media dating back to 2008 describe how some South African HIV patients and schoolchildren smoked ARVs for their “hallucinogenic and relaxing effect” [11]. In 2010, the news media issued numerous reports on *whoonga* (spelled *wunga* in Zulu), an apparent cocktail of drugs that many believe to contain ARVs (namely efavirenz) and illicit substances such as methamphetamine, heroin, and/or marijuana [8, 12, 13]. Efavirenz is a non-nucleoside reverse transcriptase inhibitor (“NNRTI”) used in first-line treatment of HIV in South Africa [14]. Media attention has focused on the South African province of KwaZulu-Natal, but the phenomenon has been reported in other South African provinces and the cocktail may also be known by a different name, *nyaope* [8, 15].

There is some debate about whether whoonga contains ARVs [16, 17]. The media has reported that analyzed samples of whoonga contain heroin, morphine, strychnine (a rat poison) and, albeit inconsistently, efavirenz [16]. While there remains debate about whether whoonga contains ARVs, there is consensus that recreational ARV abuse occurs in South Africa [17]. Indeed, one community health worker reported hiding her efavirenz to prevent her boyfriend from smoking it [8].

Whoonga has also been associated with criminal activity and nonadherence to HIV treatment [8, 13, 16] Some clinicians and staff of South African ARV treatment centers described whoonga as a major challenge to HIV treatment for organizations and their patients [13]. In the context of high HIV prevalence (including estimates that 24.7% of 15-49 year-olds in KwaZulu-Natal are infected with HIV) [18], recreational use of ARVs may expose untreated HIV-infected individuals to ARVs and promote ARV resistance [19].

Despite the great impact recreational ARV use may have on the overall health of these communities, there are only two published reports on the phenomenon in the academic

literature [8, 19]. We first learned of whoonga while conducting qualitative research on *inkwaris*, a slang Zulu word for "party" where young men and women congregate to dance, use alcohol and drugs, and potentially engage in risky sexual behavior [20]. Herein, we provide a description of whoonga and its use based on interviews with 13 inkwari attendees and nine key informants from an urban South African township.

Methods

Participants and procedures

Semi-structured interviews with 13 inkwari attendees were conducted between March and July 2011. Inkwari attendees were recruited from local taverns or hostels in an urban township of Durban, the largest city of KwaZulu-Natal province in South Africa. Eligible individuals were those who (1) were 18 to 30 years old; (2) attended at least one inkwari in the township in the past month; (3) reported having engaged in unprotected vaginal or anal sex in the past three months with a non-monogamous partner; and (4) were able to provide written, informed consent. Interviews were conducted in Zulu, the local language, by trained, Zulu-speaking interviewers. Interviewers followed an interview guide developed for inkwari attendees, translated into Zulu and back-translated into English to ensure accuracy. Interview questions were open-ended to allow for clarification of responses. The inkwari attendee qualitative interview addressed six broad domains: (1) contextual factors related to the participant's community; (2) HIV and other sexually transmitted infection (STI) knowledge, perceptions, and health; (3) inkwari events; (4) narrative sexual history; (5) sexual risk and condom use patterns; and (6) drug and alcohol use. Interviews were conducted in a private setting in the township (e.g., participant homes, cars, the offices of public officials, or local taverns).

In order to understand better the motivations and behaviors of inkwari attendees and the sociocultural context in which inkwaris occur, semi-structured interviews were also conducted with nine key informants over the same period of time. Key informants were recruited from the same township as inkwari attendees using a snowballing technique. Local public officials provided a list of potential key informants, and potential key informants identified other potential key informants. Key informants were recruited through public officials, individuals at taverns and other places where alcohol is sold, and representatives of nongovernmental organizations. Potential key informants were approached by research staff and invited to participate in the study. Eligible individuals were those who were knowledgeable about inkwaris and able to provide written, informed consent. Interviews were conducted in Zulu, the local language, by trained, Zulu-speaking interviewers. Interviewers followed an interview guide developed for key informants, translated into Zulu and back-translated into English to ensure accuracy. Although the two interview guides addressed similar domains, the questions were phrased differently. Whereas the inkwari attendee interview guide sought information about personal experiences, the key informant interview guide addressed perceptions about youth behavior and conditions in the community. The key informant interview covered the following four domains: (1) contextual factors related to the participant's community; (2) inkwari events; (3) sexual risk and condom use patterns; and (4) drug and alcohol use. The interview questions were open-ended to allow for clarification of responses. Interviews were conducted in a private space located in the township (e.g., participant homes, the offices of public officials, or local taverns).

Voluntary, written informed consent was obtained from all participants before data collection began. All participants were compensated for travel expenses and time with 70 South African Rand (approximately $10 US). Data were de-identified to preserve confidentiality. Research records were maintained under lock and key. Soft copy English

language versions of transcripts and demographic data were securely transferred and then analyzed by U.S. investigators. The Institutional Review Board of Partners Healthcare and the Human Research Ethics Committee of the University of the Witwatersrand approved the study procedures.

Analytic approach

Data were analyzed using descriptive qualitative content analysis [21]. Initial concepts related to the central research questions such as substance abuse were identified based on the interview guide. These themes informed the development of a codebook consisting of a label, a definition, and an illustrative quote from the data [22]. Transcripts were reviewed for errors and the data were organized categorically using Atlas.ti® qualitative analysis software (version 6.2). The coder regularly met with US-based investigators to resolve coding inconsistencies and establish connections between the research questions and the interview data. Once whoonga was identified as an emergent theme, axial coding was conducted to further conceptualize substance abuse patterns involving ARVs. Relevant coded raw data were extracted and organized according to three sub-themes: 1) the physical description of whoonga and the context of use (appearance, content, cost, method of use, and demographics of users); 2) the effect of whoonga on the user (psychoactive effects, associated medical and social problems); and 3) the impact of whoonga on the community (perceptions of the community, resources and lack of resources to address the issue).

Results

Consistent with the ethnic make-up of the community where the research was conducted, inkwari attendees and key informants were all Zulu-speaking, Black South Africans. Although whoonga was not specifically queried by interview staff unless it was brought up by the informant, whoonga was mentioned in varying detail by 77% of informants. Transcribed as “iwunga” or “shonga” in two of the transcripts, 10 of the 13 inkwari attendees and seven of the nine key informants described whoonga as a problem in their community (Table I: Quote 1). Key informants raised concerns about whoonga when asked about drug use in their community and/or what happens at inkwaris. Inkwari attendees talked about whoonga when asked about drug use in the community, what happens at inkwaris, and HIV/STI knowledge, perceptions, and health (e.g., behaviors that put one at risk for HIV). Follow-up questioning about whoonga varied, but included questions such as what is whoonga, who is using it, how is it made, why are people using whoonga, and what can be done about it. The results are summarized below, and selected comments from the interviews, edited for grammar, are presented in the table to illustrate the themes.

Whoonga, its use and users, and its relationship to other drugs

Whoonga was described as a “new drug” in the community that is a “mixture of many things.” Two key informants and one attendee reported that whoonga contains ARVs, specifically efavirenz marketed as “Stocrin” in South Africa (Table I: Quote 2). Respondents made no reference to any other psychoactive ingredient added to whoonga, including any other drug (illicit or otherwise). However, respondents reported that whoonga is prepared with household cleaning products and rat poison (Table I: Quote 2) and that whoonga may be mixed with *dagga* (marijuana).

None of the interviewees reported whoonga use. Six interviewees referred to users as men when speaking about whoonga. There were no specific references to women using whoonga. Five key informants said that whoonga is used by adolescents and school children, and two key informants estimated that it is used by children as young as 14 (Table I: Quote 3).

Whoonga was described as a white powder that users smoke in a “sugar straw” that is lit on one end. Those who smoke whoonga were said to congregate together, often in houses that were known as places where whoonga is used. Whoonga may also be baked into “space muffins” as an alternative to marijuana which appears to be more commonly added to this drug-containing cake. One respondent described how space muffins are sold to schoolchildren (Table I: Quote 3).

Some described whoonga as becoming more popular than ecstasy and second only to alcohol when asked about the most common substances of abuse in communities. One informant reported that whoonga is obtained from “dealers,” but there was no description of where dealers obtain whoonga or where the manufacturers obtain its ingredients. Although it is described as less expensive than alcohol, it was still considered relatively “expensive” and costs 20 to 30 South African Rand (approximately $3 US). It is unclear how much whoonga can be purchased for this amount of money.

Whoonga's effects on the person

Whoonga was described as a powerfully addictive substance with many detrimental effects on the user. Informants reported that whoonga users would smoke it every day if they had access to the drug (Table I: Quote 4). Casual use was not described. Users are said to “enjoy” whoonga because they feel “drugged”. It was suggested by one informant that whoonga enhances “sexual appetite,” but others said that whoonga causes people not to “do anything the entire day”. It is unclear if these are truly conflicting statements or if differing perceptions of the effects of whoonga on users are a result of individual differences, differences in the ingredients of the batches of whoonga being used, differences in the physiologic effects of the drug over time, or differences between intoxication, withdrawal, and/or other states.

Children who ate space muffins, which the children may not know contain a drug, reportedly became “drunk” in school. It is said that they “lust of this cake.” According to one informant, intoxication from space muffins placed a child at increased risk of rape.

Other harmful effects included reports of skin changes and weight loss (Table I: Quote 5). Whoonga users are described as having poor hygiene. Two informants believed that whoonga use puts individuals at risk for HIV infection but did not explain in what way. One key informant believed that whoonga use is associated with increased mortality (Table I: Quote 6).

Our informants did not say whether they thought whoonga users believed the drug to contain ARVs. They also did not say whether it was perceived that whoonga could be used for prophylaxis or treatment of HIV.

Whoonga's impact on the community

Perceptions of whoonga and whoonga users suggested its use is highly problematic and stigmatizing. Described as “irritating,” whoonga users were perceived to beg and steal to support a whoonga habit (Table I: Quotes 7-9). Although one interviewee remarked that some members of the police force use whoonga, whoonga users were mainly described as unemployed. Because of the considerable strain whoonga places on the community, many “do not want” whoonga users around.

Key informants described a number of community efforts to address whoonga. It is said that Community Policing Forums have been involved in raising awareness of the problems associated with whoonga and “targeting” homes where whoonga is used and youth using

whoonga. An informant described educators speaking during church services to raise awareness about whoonga and space muffins in schools.

One informant lamented a lack of access to substance abuse treatment centers in the community, saying that substance abuse treatment is not available nearby and/or not affordable (Table I: Quote 10). Available social work resources, this informant suggested, are not sufficient.

Frustrated by the lack of options for whoonga users, two inkwari attendees and two key informants asked that help for whoonga be made available to their community (Table I: Quote 11). They called upon further research and other action by the government and other organizations. Suggestions included providing jobs to young people in the community and improving access to substance abuse treatment centers.

Discussion

Our data suggest that whoonga is a highly addictive drug cocktail that may contain ARVs, specifically efavirenz. Whoonga may have a negative impact on the health, safety, and well-being of users and their communities including increased risk of HIV transmission and crime. The apparent use of whoonga by children and adolescents is alarming, especially because “space muffins” may be produced specifically for school children who unknowingly take the drug and then subsequently suffer addiction and/or other risk of harm. It does not appear that existing efforts to address whoonga are enough. Our respondents expressed a need for more to be done to address whoonga in their community.

Our report is unique in that there has been no other study of whoonga in the medical literature and that this rich narrative occurred spontaneously in the course of a discussion of substance abuse in the community. Nevertheless, there are certain limitations. First and foremost, we did not specifically set out to learn about whoonga and as such we did not explore the issues to their fullest extent with respondents. Second, none of the respondents admitted to having used whoonga. We did not exclude whoonga users from the study, but people may hesitate to admit whoonga use as it is stigmatized in the community and illegal. Alternatively, whoonga use at inkwari may not be common or whoonga users not be easily recruited using our approach. Although many of the respondents were very knowledgeable about substance abuse in the community, much of what they contributed regarding whoonga use may be second-hand. However, in the absence of other substantial research reports on whoonga in the medical literature, these descriptions are valuable and may guide future research.

Third, the description of the effects of whoonga on the user, such as skin problems and its addictive nature, are reminiscent of heroin and methamphetamine which we know are available in the area. Reports in the media suggest that joint aches, muscle cramps, stomach cramping, “pain,” and sleeplessness are characteristic of whoonga withdrawal [16, 23], and this may represent opiate withdrawal. However, we do not know what the reaction to ARVs would be if they were smoked in large quantities over long periods of time in a manner consistent with the abuse of stimulants or opiates. Therefore, it is impossible to know whether the addictive and otherwise harmful components of whoonga are related to illicit substances, ARVs, other whoonga additives, or a combination of these. It will be important to attempt to discern through future research the makeup of whoonga preparations and the individual contribution or particular synergistic effects of its components on health and psyche.

Some argue that widespread recreational ARV use is unlikely because ARVs are unlikely to produce a desirable psychoactive effect [8, 16, 17]; however, this assertion may

underestimate the potential abuse liability of these medications. Fifty-three percent of patients taking efavirenz report neuropsychiatric complaints, and the manufacturer warns that it may cause “euphoria” [24]. Efavirenz may have a similar effect on 5-HT_{2A} receptors in the brain as the hallucinogenic drug, lysergic acid diethylamide (LSD) [25]. Although we know nothing about how the psychoactive effects may be modified if smoked, efavirenz was associated with manic symptoms in an HIV-positive woman with a history of cocaine abuse who took 90 tablets “in search of new sensations” [26 p. 270]. Another woman reported feeling “high” and “alienated” with “artificial visual impressions” after taking 26 tablets of efavirenz in a suicide attempt [27]. These symptoms resolved within days and her clinicians attributed them to efavirenz intoxication.

Recreational ARV use has escaped the notice of the two major epidemiological studies of substance abuse in South Africa. One possibility is that recreational ARV use is rare. However, the failure to detect recreational ARV use may be due to timing and/or methods. The South Africa Stress and Health study surveyed a representative sample of South Africans between 2002 and 2004 [28], thus predating the public sector ARV rollout in 2004 and likely predating recreational ARV use which was first reported in 2008. Published reports of the South African Community Epidemiology Network on Drug Use (SACENDU) seem to predate the emergence of whoonga as well [29, 30]. SACENDU tracks alcohol and illicit drug use among individuals seeking substance abuse treatment at centers across South Africa. Their most recent summary does not mention individuals seeking treatment for whoonga specifically or recreational ARV use in general between July 2007 and December 2011 [31]. This may be, as one informant describes, because whoonga users are unable to access substance abuse treatment. People with whoonga abuse may also not seek treatment. Another possibility is that whoonga users are classified in the study as using other drugs, such as marijuana or heroin.

The lack of epidemiological data is unfortunate, because recreational ARV use is concerning. We do not know how whoonga might impact HIV treatment efforts. Even if whoonga does not consistently contain efavirenz, if many people in the affected communities believe that efavirenz has the potential to generate a “high”, this perception may drive recreational efavirenz use in the community independent of whoonga. Although our informants did not specify how whoonga was related to HIV risk, whoonga use may be associated with risky sexual practices (via increasing “sexual appetite” or the number of intimate partners) which increase the risk of HIV transmission, diversion of ARV medication leading to problems of supply and adherence, and/or ARV exposure in untreated HIV-infected individuals leading to ARV resistance [8, 19]. Any resistance to efavirenz would likely also confer resistance to other NNRTIs because of class resistance risks [32]. Because NNRTIs are the mainstay of HIV treatment regimens in South Africa, any behavior linked to increased NNRTI resistance may compromise treatment response and must be taken quite seriously.

Assessment of the public health impact of whoonga and any potential intervention will require further research. Epidemiological methods may need to be modified to assess for whoonga and the recreational use of ARVs. Because only three participants reported that whoonga contains ARVs and we have no objective evidence that ARVs are in whoonga, we cannot say with confidence that whoonga contains ARVs. Additional research is needed to determine whether or not whoonga contains ARVs, and if so, the specific ARVs it contains. Other studies needed to document this phenomenon may explore the contents of South African street drugs and the psychoactive properties, pharmacokinetics, bioavailability, and likelihood of developing resistance when ARVs are smoked [19].

Conclusions

This is the first study in the medical literature to provide a description of whoonga, a drug cocktail believed to contain efavirenz whose use is common to an area of South Africa with high HIV prevalence. Whoonga is an addictive substance whose use is highly stigmatized and appears to have a devastating impact on persons who use it. A neglected area of research, our informants call for action to address this emerging form of substance abuse. Regardless of whether or not whoonga consistently contains ARVs, strategies to address whoonga are important because of its likely negative impact on HIV treatment and prevention efforts.

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Table I

Subthemes identified by informants about *whoonga* and its impact, the number of the nine key informants ("# KI") and 13 *inkwari* attendees ("# IA") who described the theme, and one or more representative quotations from the interviews to illustrate the subtheme.

Subtheme	#KI	#IA	Representative quotation
Problematic whoonga use	7	10	Quote 1: The most problematic thing here in my neighborhood is the whoonga. -*20 year-old male*
Whoonga appearance and contents	3	4	Quote 2: They put an ARV pill, they call it "Stocrin", so they put that Stocrin, and they put Handy Andy[a] and a Rattex[b], they say Handy Andy holds it together, you know that Handy Andy gets dry, so it is able to hold it together and enables them to cut them in pieces, like a cake you see. -*43 year-old male*
Whoonga use by children	4	0	Quote 3: [Whoonga affects] young people, very young, at about 14 years; some were schooling and no longer at school… I ask them, 'why are you not at school?' And They will say, 'I will see next year.' And in schools, it is said that they are selling space muffins… It's *dagga*[c], maybe they are putting a whoonga as well, but the principal told us during church that we must be alert. -*43 year-old female*
Pattern of use	2	5	Quote 4: If the drug is available it needs to be smoked. If the drug is available, even… if it's like this (*using hands to show a large quantity*), you will smoke it until it gets finished. If that takes you five months, you can take it for five months without going outside of this house. Five months to finish this drug. -*30 year-old male*
Whoonga's effect	1	3	Quote 5: It's only peeling them. You see, even your skin becomes different. You become dark and become skinny. You lose weight, you see. -*25 year-old male* Quote 6: There is this drug that killed so many people – the whoonga. -*20 year-old male*
Impact of whoonga in the community	2	8	Quote 7: Like house breaking… They break in and steal a TV, just because they want to sell it and buy this whoonga. -*38 year-old male* Quote 8: People who use [whoonga] mostly… are the people who are not working … No one wants them, my brother. Parents do not want them in the community. Even if you have done a washing, my brother, and your clothes are on the line, you watch out, pass some time and go and check that your things are still there. You cannot go anywhere if you have washed because [of] those people. -*27 year-old male* Quote 9: Even if you are trying to talk to them, they don't want to listen. They are always asking for money, "can you give me one rand there, my sister?" -*20 year-old female*
Need for intervention	2	2	Quote 10: People are going to arrest children who are taking whoonga. Then, they will be told that they must take the children to rehab. It costs money to [go to] rehab; it's not easy to take someone to rehab. We don't have [rehab near here]… Rehabs are needed, because we are relying on social workers most of the time, you see. -*52 year-old male* Quote 11: Those people who are sticking mostly on whoonga you see… what are the means maybe… that an organization could take them out of this situation they are in? Maybe, what are things that should be done, or what can you tell us as the community, you see, that we can say to them, "brothers, there is something like this and you can get help and so on"? -*23 year-old male*

[a] Household cleaning solution;

[b] Rat poison;

[c] Marijuana