

Original Article

Seroprevalence, attitudes and practices of the Baka Pygmies of eastern Cameroon towards HIV and AIDS

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Abstract

Introduction: The vulnerable health status of Pygmies is the result of their continual exposure to the modern world. The purpose of this study was to determine the prevalence of HIV and the attitudes and practices of Baka populations towards HIV infection.

Methodology: A descriptive and cross-sectional study was conducted over a five-month period in 12 Pygmy camps. A questionnaire was completed to collect information, and anonymous screenings were held. For screening, whole blood was collected. The Determine HIV-1/2 test was used as the rapid test, and the SD Bioline HIV-1/2 test was used as the second test. Associations between variables were checked.

Results: A total of 560 Baka were recruited. The sex ratio was 0.92. Among the means of transmission, sexual intercourse was the most frequently cited (37.6%). A minority (28.5%) knew where to undergo an HIV test, 24.2% did not know that there exists treatment enabling patients to have a higher quality of life, and 75.7% had never used a condom. A total of 86.9% had never been tested for HIV. Subjects who had sex with the Bantu were three times more likely to be infected ($p = 0.02$), as well as those who had had more than three sexual partners.

Conclusions: The changes affecting contemporary societies are inevitably influenced by the dominant factors of modernity, particularly progress, development, and social dynamics in all their aspects. Baka knowledge about HIV/AIDS is limited. Educational efforts, increased awareness, and guidance are needed.

Key words: Pygmies; HIV/AIDS; HIV prevalence; attitudes; practices; Cameroon.

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Introduction

The major strategies used to address human immunodeficiency virus (HIV) are intended to enhance the response from all stakeholders in the health sector in order to achieve universal access to services for prevention, diagnosis, treatment, care, and support for people affected by and infected with HIV [1]. The arrival of antiretroviral therapy (ART) has unquestionably improved the morbidity and mortality of people living with HIV (PLHIV), even if access to these treatments remains limited in Africa [2]. Despite the increasing financial resources available and the increasing political commitment, the epidemic continues to progress, especially among indigenous populations and, in particular, among the Pygmies [3].

The great majority of Baka Pygmies live in implanted camps in the eastern region of Cameroon, either in the forest or along the main highways, thus maintaining relations with the Bantu, who form the

majority of the local residents. Having been isolated within the forests for a long time, Pygmies are rather underrepresented on the national political scene, and their rights with respect to access to land, education, and health services continue to be regularly denied; this is repeatedly denounced by those organizations that defend human rights [3].

The term AIDS, acquired immunodeficiency syndrome, is almost unknown in the Pygmy environment [4]. Its manifestations and symptoms are not interpreted as a secondary disease or infection, but rather as the result of a supernatural disease resulting from a spell for the often emaciated patient [4]. The vulnerable health status of the Pygmies results from their continuous exposure to the modern world, which, over the years, has resulted in a mixing of their population with other people, exposing them to many diseases, including, most severely, HIV infection. The transformation of their traditional way of life,

following deforestation, has forced them to work as seasonal laborers or as farmers [3]. We must also note their limited access to basic social services and modern channels of communication. Furthermore, there are traditional ancestral practices rooted in their lifestyle, such as early sexuality and other risk factors, often conducted in ignorance of basic hygiene, such as circumcision, scarification, tattoos, and traditional childbirth [5]. To all this one may add sexual exploitation by the well-paid workers of forestry companies.

The mobility and the remoteness of the Pygmies have limited their exposure to certain diseases and have also made the provision of access to health services more difficult, thereby creating an obstacle to, among other health policies, the fight against HIV/AIDS. A study conducted in Cameroon showed that 80% of the Pygmy population attends hospitals, but they face difficulties such as their lack of resources to pay for healthcare, the distance they must travel, and the discrimination they face from their Bantu neighbors [6].

Although several studies on knowledge, attitudes, and practices regarding HIV/AIDS have been conducted in Cameroon, those which show any interest in the Pygmies are rare. Indeed, in 1995, Kaptue *et al.* found an HIV prevalence of zero (0/207) among the Pygmies of the southeastern region of Cameroon and northern Congo [7]. On the other hand, Ndumbe *et al.* in 1993 found HIV prevalence in the Pygmies of eastern Cameroon of 0.7% (1/140) [8]. It should be noted that, until 1990, no cases of infection had been recorded in Cameroon in this population [6]. Reliable data indicates that, between 1993 and 2003, the prevalence of HIV increased from 0.7% to 4% among the Baka in the region of Yokadouma in East Cameroon [4].

This study shows the current state of HIV infection in this marginalized population. It demonstrates the limits of the current support structure and offers solutions to improve quality of care for the benefit of the Baka.

Methodology

Study population

The Pygmies live in camps, which constitute their housing. This study was conducted in Baka Pygmy camps of the Upper Nyong Division, headquartered in Abong-Mbang, and located on the secondary side of Number 10 National Road in East Cameroon. Abong-Mbang was created in 1884 as a base of the German administration. It comprises a mixture of important

ethnic and linguistic communities. Dr. Eugene Jamot created the reference center used in the fight against sleeping sickness in Cameroon from 1879 to 1937.

The following camps were investigated: Messoume, Mbang (Kouam), Airfields, Kendjo, Ndjibot, Cyrie, Mayos, Dimpam, Diassa, Bitsoumam, Elandjo, Mendzo, and Nomedjoh. Each camp benefits from the presence of a delegate of the camp, a focal point, facilitator, and interpreter.

Study type

This was a descriptive and prospective study that ran for a period of five months, from January to June 2014. This study focused on the Baka Pygmies of the Upper Nyong. Subjects who were recognized as Baka Pygmies by members of this community and who agreed to participate were therefore included. For married women, consent was given by the spouse, per the traditional rules of this environment. In addition, young people of at least 14 years of age were included because, at this age, young Baka people are sent for marriage and are therefore vulnerable targets for infections.

Data collection

Data was collected through a questionnaire pre-established and tested on 20 subjects. The data was collected following confidential and individual interviews of 10 minutes each. Contact with the population was preceded by a meeting with the head of the camp, during which an appointment was made for the visit of the research team.

In each camp, prior to the collection of data, a short announcement was made by the delegate of the camp on points such as the purpose of the study and its merits, the importance of the testing, and the confidentiality of the results. Among the members of the study team was a medical lab technician made available by the district hospital of Abong-Mbang for serological testing.

This study comprised two stages: (i) a data collection stage, which involved the questionnaire; and (ii) a stage centered on voluntary testing of the Baka Pygmies.

Studied variables

Several variables were sought: the socio-demographic profile of the patients (age, sex, place of residence, marital status, level of study, profession); variables related to the Baka Pygmies' knowledge of HIV/AIDS (existence of HIV, transmission routes of AIDS, methods of prevention and means of diagnosis

of HIV/AIDS infection); variables related to the different attitudes of the Baka Pygmies with regard to HIV/AIDS (opinion on the origin, reality, means of protection from HIV/AIDS; attitudes towards people with HIV/AIDS; attitude in cases of contamination, attitude towards screening test); and variables related to the practices of the Baka Pygmies regarding HIV/AIDS (practice of prevention of HIV/AIDS, screening practices, reasons for non-use of condoms, and means used to prevent HIV and AIDS).

Further analysis on the basis of voluntary testing

This test was performed after several steps, which included sensitization of the Pygmies, the completion of pre-test counseling before each screening, and voluntary and anonymous testing under the supervision of officials of the Regional Technical Group (RTG) for HIV/AIDS control in the East Region of Cameroon. These regional officials made tests and screening material available to the research team.

During this phase, the pre-test counseling was provided by the delegate of the camp trained for this purpose. Blood collection and testing were done with the assistance of the lab technician of the Abong-Mbang district hospital. Collection was conducted either in the hall of the chief's palace, in a classroom, or in the cultural halls of the Pygmy camps. For each test, 5 mL of whole blood was collected for serological analysis of HIV with respect to the national screening algorithm applicable in Cameroon [8].

The results were anonymous and confidential, and their delivery was preceded by post-test counseling. Those with positive results were directed to the Abong-Mbang district hospital for follow-up, with the support of the non-governmental organization FAIRMED, who made a commitment to further manage these cases.

Data analysis

For whole blood analysis, the Determine HIV-1/2 test (Orasure Technologies Inc, Bethlehem, USA) was used as the first rapid test, while the SD Bioline HIV-1/2 test (Alere Medical Co, Matsuhidal, Japan) was used as the second rapid test [9]. For all tests positive with Determine, a second test was performed using Bioline. If the second test proved positive, the individual concerned was considered to be positive. Where the first test was positive and the second negative, the result was considered to be indeterminate [10].

Data was entered using an input mask previously designed using the software Epi Info, version 7. This was then exported to SPSS software (Statistical Package for the Social Sciences), version 17, for analysis [11]. Elements of descriptive statistics were used, and calculations of proportions and averages were completed. Chi-square and Student's *t* tests were used for the measurement of associations. For this multicenter study, the Mann-Whitney test was used for harmonization of the results. The rate of significance was set at 5%.

The study was carried out with the approval of the institutional ethics committee of the University of Douala. The consent of subjects participating in the study was required. The operations took place under strict confidentiality and anonymity.

Results

Socio-demographic characteristics of the sample

Overall, 560 Pygmies participated in this study. Of these, 269 (48.1%) were male and 291 (51.9%) were female, for a sex ratio of 0.92. Concerning their level of education, results indicated that 412 (73.5%) participants were limited to primary school level, 91 (16.2%) were not educated at all, and 57 (10.2%) had had access to secondary school. Regarding marital status, 284 (50.7%) were married, 184 (32.8%) were single, and 50 (8.9%) were polygamists. Subjects were recruited in 12 Pygmy camps. The most represented camp was Mayoswith, with 121 (21.6%) subjects, and the least represented was Bitsouman, with 12 (2.1%) subjects. Among the various camps surveyed, Kouam had the highest HIV/AIDS seroprevalence rate, representing 21.7% (5/23) of the total population.

Seroprevalence

According to the results of organized screening, 23 (4.1%) Pygmies had a positive status for HIV. More women than men were infected: 5.1 % against 2.9%, ($p = 0.1$). When the number of sexual partners was taken into account, the results revealed that subjects with more than three sexual partners were most likely to be infected with HIV ($p = 0.03$).

The study also looked into the influence of sex with the Bantu. The results showed that subjects who had had sexual intercourse with the Bantu were twice as likely to be infected with HIV ($p = 0.02$). Specifically, 225 (40.2%) had already had intercourse with Bantus, and these contacts were more pronounced among women than men ($p = 0.005$) (Table 1).

Table 1. Seroprevalence of HIV on the basis of sexual intercourse with Bantus and number of sexual partners

		HIV-negative n (%)	HIV-positive n (%)	P
Sexual intercourse with the Bantu	No	327 (97.6)	8 (2.3)	0.02
	Yes	210 (93.3)	15 (6.6)	
Number of sexual partners	0	61 (100)	0	0.03
	1	218 (97.3)	6 (2.6)	
	2	138 (93.8)	9 (6.1)	
	3	57 (96.6)	2 (3.3)	
	> 3	63 (91.3)	6 (8.7)	

Table 2. Knowledge on HIV and AIDS by gender

	Total n (%)	Female n (%)	Male n (%)	P
Contagious disease	290 (51.7)	125 (42.9)	165 (61.3)	< 0.0001
<i>Modes of transmission</i>				
Mother-to-child	138 (24.6)	19 (6.5)	119 (44.2)	< 0.0001
Scarifications	191 (34.1)	54 (18.5)	137 (50.9)	< 0.0001
Unprotected sex	211 (37.6)	60 (20.6)	151 (56.1)	< 0.0001
Fidelity	164 (29.2)	54 (18.5)	110 (40.8)	< 0.0001
Condom	194 (34.6)	43 (14.7)	151 (56.1)	< 0.0001
Abstinence	123 (21.9)	21 (7.2)	102 (37.9)	< 0.0001
Support and screening	160 (28.5)	16 (5.5)	144 (53.5)	< 0.0001
Knowledge of a treatment	136 (24.2)	18 (6.1)	118 (43.8)	< 0.0001

Table 3. Distribution of subjects according to their attitudes towards HIV/AIDS

Attitudes	Total n (%)	Female n (%)	Male n (%)	P
Willing to live with a PLHIV	80 (14.2)	17 (5.8)	63 (23.4)	< 0.0001
Willing to share a meal with a PLHIV	115 (20.5)	22 (7.5)	93 (34.5)	< 0.0001
Sleep with a PLHIV	102 (18.2)	18 (6.1)	84 (31.2)	< 0.0001

PLHIV: person living with HIV/AIDS

Table 4. Distribution of subjects using a condom during intercourse and expression of the reasons for non-use of condoms by gender

	Total n (%)	Female n (%)	Male n (%)	P
<i>Had already used a condom</i>				
No	424 (75.7)	256 (87.9)	168 (62.4)	< 0.0001
Yes	136 (24.3)	35 (12)	101 (37.5)	
<i>Reasons for the non-use</i>				
It is not good	52 (9.3)	26 (8.9)	26 (9.6)	0.8
Reduce pleasure	18 (3.2)	2 (0.7)	16 (5.9)	0.001
Expensive	21 (3.7)	13 (4.5)	8 (4.7)	0.4
Not found	104 (18.5)	76 (26.1)	28 (10.4)	< 0.0001
Have a child	22 (3.9)	10 (3.4)	12 (4.5)	0.6
Partner's refusal	64 (11.4)	49 (16.8)	15 (5.6)	< 0.0001
<i>Has realized a screening test</i>				
No	487 (86.9)	274 (94.1)	213 (79.2)	< 0.05
Yes	73 (13.1)	17 (5.8)	56 (20.8)	

The results showed that 377 (67.3%) Baka Pygmies had previously heard about HIV/AIDS. The interviewees cited health personnel as the main source of information on HIV/AIDS (28.4%), followed by relatives (13.1%) and schools (5.3%). Among the means of transmission of HIV, unprotected sex was most often cited (37.7%), followed by scarification (34.1%) and mother-to-child transmission (24.6%). To prevent HIV/AIDS, 34.6% of the Baka Pygmies recommended the use of condoms, while 29.3% suggested fidelity and 21.9% suggested abstinence. On the issue of screening tests, 28.6% of the Baka Pygmies acknowledged being aware of screening. Regarding the existence of a treatment for AIDS, only 24.3% responded positively. Overall, the results revealed that men were better informed than were women ($p < 0.05$). Concerning knowledge of places where screening could be accessed, of the 560 Baka Pygmies who participated in the study, 119 knew where to go for this test. The health center was the most well-known screening site (21.2%), followed by the healer (5.3%) (Table 2).

Behavior of the Baka Pygmies towards HIV/AIDS

Among the surveyed subjects, 80 (14.3%) expressed willingness to live with a person living with HIV (PLHIV), 115 (20.5%) were willing to share a meal with a PLHIV and 102 (18.2%) would sleep with a PLHIV. When gender was taken into account, men were more able to adopt the attitudes above compared to women ($p < 0.05$) (Table 3).

Practices of the Baka Pygmies toward HIV/AIDS

Of those interviewed, 424 (75.7%) reported having never used a condom during intercourse. Comparing the level of use by gender, approximately three times more men than women used condoms ($p < 0.05$). Among those who did not use them, 104 (18.5%) gave as the reason the impossibility of obtaining condoms in their camps, 64 (11.4%) cited the refusal of their partner, 52 (9.3%) stated that it is not convenient to use a condom during sexual intercourse. On the other hand, 2 women compared to 16 men believed that condoms reduce the pleasure of sex ($p = 0.05$). Three times more women reported difficulty finding condoms in their camps ($p < 0.05$). Three times more women, as a reason for non-use of condoms, reported the refusal of their partners ($p < 0.05$).

With respect to testing for HIV status, 487 (86.9%) of the Baka Pygmies had never been tested for HIV/AIDS ($p < 0.05$). Among these, 126 (26.5%) did not know where to access the test, 128 (26.3%)

responded that the test is expensive, and 111 (22.8%) were afraid of the results of the test (Table 4).

This study also looked at the knowledge of HIV status of sexual partners. The results showed that eight times more men knew the HIV status of their female partners ($p < 0.05$).

Discussion

This study includes an update on the seroprevalence of HIV/AIDS in the Baka Pygmies as well as data on the attitudes and practices of these populations towards HIV infection. As the database of studies on the problem of HIV in the Pygmy population is very poor, this work takes into account several important aspects.

Characteristics of the sampled population

Overall, 560 Pygmies participated in this study. The distribution of subjects by sex correlates with the results of the demographic health survey of Cameroon 2011 (DHS IV), which revealed that a higher proportion of women than men were infected [12].

Among the study population, there was a significant percentage of non-educated persons (91; 16.2%). This can be explained by the absence of primary and nursery schools in the Pygmy camps, lack of sensitization of these populations to educational issues, the stigma they face in Bantu schools, the lack of financial resources to cover the costs of schooling, and the long travel distance to schools in the Bantu villages.

Concerning the marital status of the interviewees, 284 (50.7%) were married and 50 (8.9%) were polygamous. The Baka Pygmies marry early, sometimes even at the age of 12 years, which may explain the high rate of married people in this series.

This work had some limitations. The data collection coincided with the dry season, during which the Pygmies hunt and fish, leaving the camps. Some Pygmies were also reluctant to participate in this work due to their distrust of the Bantu. The quality of interpretations/translations could also be considered a bias in this study, as can the reliability of the answers.

Infection rate of HIV of Pygmies in the workplace

The obtained seroprevalence was 4.1%. The seroprevalence increased considerably when compared to the rate obtained by Ndumbe *et al.* in 1993, which was 0.7% (1/140) [8]. The study by Habakkuk in 2002 of the Pygmies of Bipindi and Lolodorf found a seroprevalence of 1.5% (2/137) [13]. Results obtained in this study are very close to that of the Cameroonian

general population (4.3%), but less pronounced than that of the eastern region of Cameroon (6.3%), as shown by the Cameroon National AIDS Control Committee in 2011 [14].

The rate of infection in Pygmy environments seems to follow the same progression as that of the general population of Cameroon, with a period of gradual growth followed by a period of relative stabilization [10]. However, it is important to note that, over time, there has been an inevitable mixing of Bantu people with the Pygmies, who resolutely seek modernism [15]. The consequence is an increase in the number of HIV cases.

The arrival of forestry and mining companies, infrastructural projects, and protection of animals and plants, all of which restrict the Pygmies' access to forest resources, has resulted in a change in their lifestyle, forcing them out of the forest to work as farmers or seasonal workers. HIV-1 was the serotype found during screening, which was the same serotype found by Ndumbe *et al.* and Ndembi *et al.* [1,8].

Women (5.1%) have higher infection rates than do men (2.9%). This is in line with the distribution by sex of infection in the general population of Cameroon [12]. Ramjee *et al.* revealed that, for women in sub-Saharan Africa, there are a multitude of factors that increase their vulnerability to HIV infection, integrating biological, behavioral socio-economic, cultural, and structural risks. This leads to the conspicuous increase in the rate of HIV infection among these women as compared to their male counterparts [16]. There is also the fact that it is a privilege for a young female Baka to maintain a relationship with a Bantu, because of the superiority complex and sexual exploitation orchestrated by well-paid Bantu workers employed by the surrounding forestry and mining companies.

The analysis of the number of sexual partners showed that subjects with more than three sexual partners had a higher seroprevalence. This result is similar to that of Onoya *et al.* in South Africa [17] and confirms the fact that having more sexual partners is a risk factor for HIV/AIDS in general [18].

Among the various camps surveyed, the Kouam camp presented the highest seroprevalence rate. This result can be explained by its proximity to the town of Abong-Mbang. Only 18 km separates the camp from this metropolis, thus favoring permanent contacts between Bantu and Pygmies. The low seroprevalence rate obtained in the most remote camps and in those most difficult to access confirms this hypothesis.

These results show that subjects having sexual intercourse with the Bantu double their risk of being infected with HIV/AIDS. This confirms the consequences of inter-population mixing.

Disclosure of infection

This study appraised the quality of information related to HIV infection and AIDS in the Baka populations of Cameroon. About 67.3% of the Pygmies surveyed had heard about HIV/AIDS. This result is higher than that obtained by UNICEF among the Pygmies of Congo Brazzaville (56.0%) and that of Habakkuk from the Pygmies of Bipindi and Lolodorf (53.9%) [3,19]; however, a greater response rate was found in Schopper's study [20]. This difference can be justified by the fact that information and sensitization on HIV/AIDS issues is growing from year to year, crossing borders and also reaching indigenous populations. Moreover, it is proof that these populations are able to assimilate the baseline data on this infection, provided they are adequately supervised.

The information collected on the modes of transmission of HIV indicated by these populations corroborates the above. Indeed, among the modes of transmission cited by participants, unprotected sex was the most cited (37.7%), followed by scarification (34.1%) and mother-to-child transmission (24.6%). Yet Habakkuk in 2002, among the Pygmies of Bipindi and Lolodorf, found that 5.8% of the Pygmies had cited sexual intercourse as a method of transmission, and no Pygmies had cited mother-to-child transmission [13].

Similarly, on the question related to the means used for prevention of HIV/AIDS, 34.6% of the Baka Pygmies recommended the use of condoms, while 29.3% suggested fidelity and 21.9% suggested abstinence. These results are higher than those found by Habakkuk, who obtained a reported rate of 2.2% for the use of condoms, 2.3% for fidelity, and zero for abstinence [13].

If, from the above results, we may note perceptible advances in terms of knowledge and information of HIV/AIDS among the Baka Pygmies, it must also be noted that 71.4% of respondents did not know that there is a test for HIV/AIDS, and 75.7% did not know that there is treatment allowing PLHIV to live an improved life. This testifies to the lack of supervision of these populations. Information in their possession remains insufficient and limited, and the great isolation in which these people live adds to this problem.

Conduct and behavior towards infection

This study looked at the attitudes of the Baka Pygmies to HIV infection and AIDS. Among the surveyed subjects, 80 (14.2%) said they were ready to live with a person living with HIV. These results support the need to increase awareness and education in general of the Pygmies on health issues. Indeed, it is worth remembering that, due to Pygmy customs, patients, and in particular those patients deemed as seriously ill, are neglected, as they are considered to be victims of an evil spell.

The results indicate that men were more likely to maintain close relationships with eventually sick patients. This can be explained by the place of the man as the head in African societies in general, by levels of education, by generally more advanced knowledge of infection, and by the pronounced trend towards multiple partnerships [21]. In general, the use of condoms is very uncommon in these populations; 75.7% of those surveyed reported having never used condoms during sexual intercourse. Mvele and Habbakuk, respectively, reported that 70.1% and 95.4% of the Pygmies reported never having used a condom [13,22]. The reasons include refusal of the partner and the scarcity and cost of condoms in these camps. However, some still maintain that they are bound by their religious beliefs to have sexual intercourse in a natural way and, as a result, the use of condoms is considered by them to be sacrilege.

Concerning the test for HIV, 86.9% of the Baka Pygmies have never had a screening test for HIV/AIDS. Some argue that they do not know where this test is available, others that it is expensive, and others claim to be afraid of the results. This inevitably reminds us of the isolation and poverty in which the Baka Pygmies live, which restrict their access to information and awareness.

During the investigation, 94.1% of the participants agreed to have the HIV test. The difference between men and women who deliberately accepted this test was not significant. These results are close to those found by Habakkuk, who noted 93.9% for the rate of acceptance of this test [13]. This can easily be interpreted as the desire of the subjects to determine their HIV status, particularly given that the screening was preceded by a sensitization campaign in the various camps. However, it can also be interpreted as being the result of a banal act, because it is true that the Pygmies are attracted by any action which they deem modern and organized freely by foreigners in the interest of development.

Certainly, the mutations that occur do not affect everyone in the same way. It is the most vulnerable (in other words, the poor) who are struggling to cope with the economic and socio-cultural upheavals in progress [23]. The diachronic study of African urban society shows that it is in a transition phase in which the integration of foreign values seems very strong [24]. In particular, in the Pygmy population, exposure to the modern world in their quest for development can be considered as a form of social change through their own dynamic. This collides with the new reality, not always in a beneficial way, calling for a reflection on its merits, or at least on strategies for support of the latter, especially through concepts of the socio-anthropology of development [24].

Conclusions

The seroprevalence of HIV in the eastern Baka Pygmy population is close to that of the general population of Cameroon. However, the information on the Pygmies have about this infection is still insufficient and limited, although some improvements were noted over time concerning their attitudes and practices towards HIV/AIDS. Given the inter-population mix, a factor favoring this infection, it is imperative that measures benefiting the Pygmy populations be taken.

Authors' contributions

EN designed the study. All the authors undertook the data collection, the statistical analysis, and drafted the manuscript. All approved the submitted version of the manuscript.

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