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Psychological assessment of violent behaviors in schizophrenic patients followed up in My EL Hassan health center of Kenitra, Morocco

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Abstract

Background Disorders of the aggressive behavior frequently mark the entry in schizophrenia. They are not specific and very varied. The objective of this study was to assess the different risk factors associated with the manifestation of violent and aggressive behavior of schizophrenic patients who follow consultations in service of psychiatry at Kenitra, Morocco. One-hundred twenty-seven patients with schizophrenia were included, and the Modified Overt Aggression Scale (MOAS) and Positive and Negative Syndrome Scale (PANSS) were used respectively to assess the state of aggressiveness and to identify the type of psychotic symptomatology of schizophrenic patients. Clinical and sociodemographic data were obtained from all patients.

Results The study shows that criminal history, drug addiction, motives for aggressiveness, and the moment of aggressiveness are all potential factors for aggression, and the profile of the patient likely to take the act is that of young schizophrenics under 39 years old, predominantly male, and the majority are single. Judicial history, habits toxic, and the positive psychotic symptoms are reported as the most frequently risk factors. The index of Cronbach (0.64) showed a strong connection between the four items of aggression and strong relation between MOAS and PANSS categories has been shown by independent test ($p < 0.001$).

Conclusion Aggressive behavior is a frequent symptom of schizophrenia in studied population and poses many clinical challenges. It requires collaboration with the patient for handling difficult situations.

Keywords Schizophrenia, Violent behavior, Risk factors, MOAS, PANSS, Morocco

Background

Aggression has always been a phenomenon with high prevalence in the social environment and a major concern in the psychiatric field, and its direct and indirect costs are higher [1, 2]. Some psychotic symptoms and/or psychological disorders, notably schizophrenia, are often caused of violent and aggressive behavior: auditory and visual hallucinations, disorganization of thought, and personality disorders. The abuse of toxic substances is associated with impulsive behavior which can frequently be a contributing factor to manifestation of aggressive and violent behavior in mentally ill people [3–5]. The link between aggressive behavior and schizophrenia seems obvious [6]. However, in certain situations, like physical or psychological overflows, violence and aggression are more frequent in the acute phase, because hallucinations and delusions generate anxiety that the suffering person does not know how to manage and express [7]. It is also important to understand that the sick person

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experiences a reality that is different from ours but which has full meaning for them. Going against one's reality means contradicting it, and sometimes denigrating it, which can encourage aggressive behavior [8]. The prevalence of aggressiveness in psychiatry varies greatly, even when comparing studies carried out with similar methods [9–11].

Several factors could be at the origin of violent behavior in schizophrenic patients; first of all, genetic factors have an influence on the development of aggressiveness [6]. Hormonal activity, such testosterone, influences aggressive behaviors [11]. Certain personality traits, such as hostility, irritability, and anxiety, increase the likelihood of engaging in aggressive behaviors [12].

Among environment, a high temperature increases affects hostile cognitions and arousal and, consequently, the likelihood of engaging in aggressive behaviors [3, 11].

Psychoactive substances are considered as exogenous factors of schizophrenia and are classified as triggering violent behavior in schizophrenic patients alongside repeated suicide attempts [6]. Schizophrenic patients are more exposed to addiction to psychoactive substances than the general population [12].

Several studies reports that 13–15% of patients in acute care units commit aggressive acts during their hospitalization [12–14], with the exception of Italian studies where the prevalence is 6 to 7% of patients [15, 16]. A systematic review highlights an average of 9.3 aggressive events per bed/year with rates ranging from 0.4 to 59.9 [10]. The lowest rates are observed in open or semi-open units [10, 17]. In German-speaking Switzerland, between 1.8 and 3.5 events are reported per 100 days of treatment in an acute care unit [13, 18].

Previous studies investigated the risk factors associated with violence in psychosis typically adopt a cross-sectional approach and are conducted in developed countries [19–23]. Several cross-sectional studies have explored the risk factors associated with violence in psychosis and are conducted in well-developed regions. In contrast, our study aims to explore the sociodemographic aspects, clinical profiles, and medication usage of schizophrenia patients through a longitudinal design. We anticipate that more severe psychiatric and depressive symptoms, along with reduced insight into the illness and insomnia, will heighten the likelihood of violent behavior.

Specifically, our design allows for the identification of risk factors for violent behavior among patients residing in Kenitra city, Morocco, a middle-income country. This approach enhances the applicability of our findings to similar developing regions. Additionally, our study seeks to assess risk factors and offer guidance for the prevention and management of potentially hazardous behaviors among patients with schizophrenia and other psychoses in such settings. The objective of this research was to evaluate the aggressive behavior of patients with schizophrenia by determining their characteristics and risk factors.

Methods

Research design and participants

This is a cross-sectional prospective study of nonhospitalized schizophrenic patients diagnosed and followed up at the My El Hassan health center of the Kenitra province, according to the diagnostic criteria of DSM-IV.

For the determination of the sample size, we opted for the following statistical formula which allowed us to define the sample size from the prevalence of the phenomenon to be studied:

$n=(Z^2\ p(1\text{-}p))/e.^2$

With:

n: Sample size.

Z: 95% confidence level, the typical value is 1.96.

e: Margin of error at 5%, the typical value is 0.05.

p: Prevalence of schizophrenia in Morocco.

According to this formula, 127 patients meeting the diagnostic criteria for DSM IV schizophrenia are requited. Our population of schizophrenic subjects is made up of 94 men and 33 women aged from 19 to 59 years. All participants were not hospitalized and followed by at least one consultation by the psychiatrist, all patients are taking medication, and they are stabilized at the time of the interview and have given their oral consent after being informed of the objective of study. Patients who have already been diagnosed with schizophrenia were involved and informed about this research work. By revealing the research protocol to them, explanations were provided by the attending psychiatrist with an explanation of the progress of all the stages.

Inclusion criteria for participants were outlined as follows: (a) aged 18 years or older, (b) diagnosed with schizophrenia (based on DSM IV criteria) through a review of medical records and a clinical interview conducted by a psychiatrist, and (c) capable of comprehending and participating in the interview as determined by the researchers. Exclusion criteria encompassed individuals with a history of substantial head injury, seizures, cerebrovascular diseases, or other neurological disorders.

Sociodemographic and clinical information

Operating sheet constructed was developed for the needs of the study, and the questionnaire comprised 17 items organized around 4 themes: one part concerns the sociodemographic characteristics, a second includes the antecedents, the third part concerns the clinical elements of schizophrenia, and the last part reserved for different categories of aggressive behavior

such as self- and hetero-aggressive behavior, the motive, and moment of aggression. Also, the medical history of each patient was recorded.

Violent behavior assessment

The Modified Overt Aggression Scale (MOAS) was employed to evaluate four categories of aggression: verbal, directed against objects, self-directed, and directed against others. Each category received a score of 0 if the corresponding aggression type was absent and 4 if it was severe. Additionally, a frequency measure was included for each behavior observed during the assessment period [24].

The PANSS is a diagnostic intensity scale which evaluates (hetero-assessment) the psychological symptoms recorded in patients who present psychotic states, particularly in schizophrenic states. The scale is presented in the form of a 30-item questionnaire. Seven items constitute the positive scale, 7 other items compose the negative scale, and, finally, 16 items concern the elements of general psychopathology and rated on 7-point intensity scale (1: normal behavior, 7: extreme psychotic state). The rating of the scale items is based on the verbal elements reported during the interview, the physical and behavioral manifestations observed, and the elements reported by the healthcare team or the family.

The MOAS and PANSS questionnaires were translated into Moroccan Arabic dialect in order to cover our sample. This translation was done without changing the scale [25].

Statistical analysis

The analysis of collected data was performed by using R software. Comparisons between the completed follow-up sample and the lost-to-follow-up sample regarding sociodemographic and clinical characteristics were conducted using the Pearson chi-square test and independent-samples *T*-test, as applicable. McNemar's test and paired-samples *T*-test were utilized to analyze differences in sociodemographic and clinical characteristics between the baseline and follow-up groups.

Results

Sociodemographic characteristics of schizophrenics

The study that we carried out on patients suffering from schizophrenia mainly involved 127 patients: 26.6% ($n=33$) were female, and 73.4% ($n=94$) were male. The sex ratio did not appear to be balanced ($p<0.05$). Furthermore, the average age of these patients is 32.4 ± 1.15 years, ranging from 19 to 59 years. Comparison of the mean age between the two sexes using the independent sample Student test shows no significant difference between male schizophrenic patients (mean age $=33.94 \pm 2.34$ years) and female schizophrenic patients (mean age $=31.89 \pm 1.33$ years) ($t=0.62$; $p<0.43$). The distribution of patients according to the activity they occupy shows that 68.75 have a profession including 11 women and 33 men and 31.25% without a profession including 6 women and 14 men. Remembering that 73.4% of patients come from urban areas and 26.6% come from rural areas.

Table 1 presents the relation between drug addiction and sociodemographic factors in schizophrenic patients. The distribution of these schizophrenic patients according to the state of drug consumption shows that

Table 1 Sociodemographic characteristics and psychoactive substance use in studied schizophrenic patients

		Without psychoactive substance use	Psychoactive substance use	Total	*p*-value
Gender	Female	33	0	33	0.01**
	Male	36	58	94	
Origin	Rural	16	17	33	0.46
	Urban	55	39	94	
Age classes	[19-29]	22	29	51	0.20
	[29–39]	38	15	53	
	[39–49]	6	8	14	
	[49–59]	4	5	9	
Family situation	Married	18	11	29	0.64
	Single	52	46	98	
Level study	Primary school	37	36	73	0.53
	Secondary school and higher	32	22	54	

** : very significant correlation is at the 1% level (2-tailed)

45.31% consume psychoactive substance such as the following: tobacco, cannabis, and Maajoune (traditional drug containing cannabis). This test shows a significant relationship between sex and drugs consumption (chi-square = 19.18; $p < 1‰$). In fact, all psychoactive substances are consumed by male patients. However, the other parameters are not statistically linked to drug consumption. However, 20 among 29 drug addicts come from urban areas, which represents 68.96%, the majority of these schizophrenic drug addicts are aged between 19 and 29 years (48.27%), and 23 among them are single (79.31%).

The clinical history of the patients

The average age of onset of the illness is 21.95 ± 0.65 years, meaning that 95% of patients contracted the condition between 20.66 years and 23.25 years, with 2.5% developing it before the age of 20 and 2.5% after the age of 24. The dispersion of the group is 23.64%, with a minimum age of 14 years and a maximum of 39 years. The distribution is fairly Gaussian (skewness = 0.61). Furthermore, out of 64 patients, 52 cases were never hospitalized at all, representing 81.3%, while the remaining patients were hospitalized 1 to 3 times, accounting for 10.9% and 4.7%, respectively.

Regarding the type of treatment followed, 53.1% of the patients were on treatment for first-generation neuroleptics, 32.6% were on treatment for second-generation neuroleptics, and the rest were on both types of treatments (combination of first and second generation).

Aggressive behavioral aspect of schizophrenic patients

The Cronbach index showed strong intra- and inter-item stability with a value of 0.64. The bivariate analysis shows strong positive correlations between the four items (Table 2) ($p < 1‰$). Beside results indicated in Table 2, physical aggression is correlated significantly to aggression against propriety towards other and self ($p < 1\%$).

When all aggressive behaviors are considered as a single construct, the analysis revealed a weak relationship between verbal aggression and physical aggression or self-aggression. Moderate relationship between aggression against propriety and physical aggression was revealed ($r = 0.561$).

For better identifying the factors associated with behavioral state of patients, we were able to look for possible links between the latter and certain sociodemographic factors, by applying the chi-square independent test at an error of 5% (Table 3). Elsewhere, sex and age do not present real risk factors with respectively $p < 0.27$ and $p < 0.88$, despite the difference in representability of the different categories. However, men are the most aggressive, 19.15% of whom are severely aggressive and 59.57% are patients to be monitored. The most incriminated age group is 19 to 39 years old, with a frequency of 14.06% and 45.31% of the cases studied are patients to be monitored. Other factors such as personal history, family situation, level of education, and family-psychological history do not show a significant link with the aggressive state of patients ($p > 0.05$). Indeed, only one person declaring to have a family history and 71.43% ($n = 35$) among single people are aggressive people or in a state of surveillance, while among 15 married patients, 9 are in a state of severe or moderate aggressiveness. On the other hand, 73.08% of sick cases responded that they had at least one mentally ill person in their family.

In contrast to these variables, others showed a strong association with categories of aggressiveness such as criminal history, psychoactive substance use, motives for aggression, and times of aggression with respectively p-values of $< 0.03, < 0.47, < 0.04$, and < 0.04. However, 90.90% of cases reported to have a criminal record are in a severe or moderate aggressive state. Likewise, of the 29 schizophrenic patients who use tobacco, 23 suffer from severe or moderate aggressiveness, which represents 79.13%. In addition, the strong link between motives and the state of aggression is translated by

Table 2 Correlation between verbal aggression, aggression against propriety, self-aggression, and physical aggression

	Verbal aggression	Aggression against propriety	Self-aggression	Physical aggression
Verbal aggression	1	0.389[a]	0.308[b]	0.398[a]
		0.001	0.013	0.001
Aggression against propriety		1	0.397[a]	0.561[a]
			0.001	0
Self-aggression			1	0.338[a]
				0.006
Physical aggression				1

[a] Very significant correlation is at the 1% level (2-tailed). [b]Significant correlation at the 5% level (2-tailed)

Table 3 Correlation between sociodemographic parameters and aggression in patients with schizophrenia

		Not aggressive	Moderate aggressive	Severe aggressive	*p*-value
Gender	Female	14	14	5	0.27
	Male	20	56	19	
Age classes	[19; 29]	14	25	12	0.88
	[29; 39]	14	34	5	
	[39; 49]	4	6	4	
	[49; 59]	2	5	2	
Psychological personal history	No	34	61	22	0.65
	Yes	0	8	2	
Familial situation	Married	6	18	5	0.80
	Single	28	52	18	
Professional activity	Work	28	40	19	0.34
	Without work	6	30	4	
Level of study	Elementary school	22	38	13	0.77
	Middle school and higher	12	32	10	
Psychological family history	Without	20	46	9	0.34
	With	14	24	14	
Criminal record	Without	32	60	13	0.03*
	With	2	10	10	
Psychoactive substance use	No	22	38	9	0.47*
	Tobacco	12	32	14	
Reason of aggressivity	None	6	0	0	0.04*
	Delirium	14	24	13	
	Sadness	0	2	0	
	Force treatment	0	4	0	
	Refusal of treatment	6	2	2	
	Under toxic effect	2	10	8	
	Mistrust	2	8	0	
	Hallucination	4	20	0	
Moment of aggressivity	Without	3	0	0	0.04*
	Before start of treatment	5	17	2	
	Stop treatment	3	6	5	
	Refusal of treatment	1	0	1	
	Under treatment	5	12	4	

* : Significant correlation at the 5% level (2-tailed)

psycho-cognitive behaviors such as generally delusions, refusals of treatment, or when under the effect of psychoactive substances. A delirium state was observed mostly in moderate aggressive patients ($n=24$) indicating that delirium constitutes the main reason of aggressivity in studied population. This situation often happens to patients especially, before starting, stopping, refusing, and/or during treatment.

Table 4 presents the result of the link between the PANSS and MOAS categories. The chi-square independent test shows a strong connection between these two dimensions (chi-square = 20.57 and < 0.000. Furthermore, out of 64 patients with a positive form, 44 patients are moderately aggressive, which represents a rate of 68, 75%; however, only one person showed positive and non-aggressive, while 18 positive cases among 64 showed severely aggressive. Regarding both forms among 17 negative cases neither person nor severely aggressive and only 5 individuals among mixed cases ($n=46$).

Discussion

Aggression is a universal phenomenon influenced by biological, neurobiological, and cultural factors. In the case of schizophrenia, some studies have shown differences in sociodemographic and clinical factors are associated with the transition to the aggressive state, whether self

Table 4 Distribution of schizophrenic patients according to PANSS and MOAS scales

		PANSS categories			Total	*p*-value
		Positive	Negative	Positive/negative		
MOAS categories	No aggressive behavior	1	11	20	32	0.01**
	Moderate aggressive behavior	44	7	21	72	
	Severe aggressive behavior	18	0	5	23	
Total		64	17	46	127	

** : very significant correlation is at the 1% level (2-tailed)

or hetero-aggressive. Our research aims to determine the frequency of schizophrenic patients with aggressive behavior and to identify the related factors to this aggression. The MOAS test was used to evaluate the different categories of aggression manifested outside of an aggressive act by using the PANSS as a scale which allowed us to extract the type of symptomatology.

The study focused on 127 schizophrenic patients aged 19 to 59 years, with average age of 32.4 ± 1.15 years, following consultations in the psychiatry department in Kenitra. A total of 74% ($n=94$) are male, and 26% ($n=33$) are female. The results of comparing the average ages between the two sexes by student test showed no significant difference between male schizophrenic patients and female schizophrenic patients. All of these schizophrenic patients generally come from the Gharb region, of which 81.3% are from the city of Kenitra and 17.7% from Sidi Yahia, Sidi Slimane, and Souk Larbaa. A total of 73.4% of patients come from urban areas, and 26.6% come from rural areas. This big difference can be explained by the consent of the family as well as the possibility of treatment. A total of 77.2% ($n=98$) are single, and 22.8% ($n=29$) are married. Concerning the level of studies, 57.4% ($n=73$) are patients whose educational level does not exceed the primary level compared to 42.6%; therefore, having a secondary school level or more which shows that the disease is not a question of intelligence and studies is possible. The distribution of patients according to occupational activity shows that 68.5 have a profession and 31.5% without a profession.

The MOAS was used as a test for assessing the state of aggressiveness, as expected, the Cronbach index shows strong intra- and inter-item stability, and it is therefore 0.64. This strong significance shows that the MOAS could be a valid measure to assess the state of aggression of Moroccan schizophrenic patients. However, our results show that 26.7% of schizophrenics do not manifest any aggressive behavior, while 73.3% are in a state of surveillance and present a strong connection of becoming severe. This aggressiveness is predominated by the male sex. This difference between men and women is also confirmed by Foley [26]. The most incriminated age group is 19 to 39 years old, with a frequency of 14.06% which confirms those reported by [27]. For others, age does not play a role [28, 29]. Finally, the third confusing fact is that violent attackers diagnosed as schizophrenic are a little older than attackers without a mental disorder [30].

Concerning the influence of sociodemographic factors in the manifestation of aggression, the results show a strong connection between certain factors such as criminal history, psychoactive substance use, motive for aggression, and the moment of aggression with respectively ($p<0.03$), ($p<0.47$), ($p<0.04$), and ($p<0.04$); in fact, 90.90% of patients with a criminal record show severe aggressive behavior, which leaves us to identify it as a cumulative aspect of risk factors. Concerning psychoactive substance use, among 29 drug addicts, 23 cases suffered from severe aggressiveness with a frequency of 79.13%. A previous study [12] have shown that drug abuse disorders are linked to a risk of violence upon admission, which confirms our results, as opposed to [31] who found that a history of drug abuse is not a discriminating risk factor for acting out in an institution. Several factors have been reported to be linked to aggression in psychiatric wards, like age [32] and gender [33], while in our study, the sex and age do not appear to be risk factors associated with aggression ($p<0.88$, $p<0.27$).

According to the PANSS scale, 50.4% of patients are positive or productive psychotic types, 13.4% negative type, while 36.2% present both types of symptoms. However, the results of association between sociodemographic factors and the PANSS show that criminal history, motive for aggressiveness, and occupational activity with respectively *p*-value ($p<0.09$, $p<0.096$, $p<0.057$) as many factors associated with the type of symptomatology. Furthermore, the link results between the PANSS and MOAS show a strong link between these two dimensions (chi-square = 20.57 and < 0.000). Aggression may be related to psychotic symptomatology. Indeed, the results show that among 64 positive form patients, 44 patients are moderately aggressive

which represents a rate of 68.75%. These results showed that positive psychotic symptoms can influence aggressive behavior, which was already found in Fazel's study [34]. Other studies revealed that schizophrenic patients with aggressive behavior history had higher rates of positive psychotic symptoms compared to schizophrenic patients without aggressive behavior history [35]. Additionally, it has been suggested that according to type of psychotic symptoms (hostile, persecutory delusions, hallucinations) at intake may be helpful for prevention aggressive behavior [36]. Moreover, in a study on 1410 schizophrenic patients followed up for 6 months in 2000, Swanson highlighted the association of positive symptoms, such as ideas of persecution, and increases the risk of minor and severe violent behavior, whereas negative symptoms are associated with reduced risk of severe violence.

According to Dubreucq et al. [37], people with serious mental disorders, and particularly schizophrenia, have a high risk of violence. Their behavior can generate significant media attention, the actions sometimes being terribly violent, which contributes to stigmatizing the people around them even though the majority of these individuals do not show violence. A better understanding of this phenomenon is, in this sense, essential in order to promote their recovery. Thus, to understand the psychological state of our patients, we chose the manifested aggression assessment test (MOAS).

Individuals diagnosed with schizophrenia often exhibit impaired impulse control and impulsive aggression. While the underlying neurobiological mechanisms of aggression in schizophrenia remain unclear, violent tendencies may be associated with abnormalities in the frontal and temporal regions of the brain. Psychotic symptoms such as delusions and hallucinations can foster suspicion and hostility, leading to aggressive behavior. Alternatively, aggression may be triggered impulsively by frustrating environmental stimuli. During acute episodes, patients may display heightened aggression and violence.

Schizophrenic patients typically have limited insight, experience cognitive disorganization, and struggle to regulate aggressive impulses. Co-occurring substance abuse, particularly alcohol, is common and exacerbates agitation and impulsivity. In individuals with schizophrenia, major depressive disorder (MDD), and bipolar disorder, the risk of homicidal behavior is elevated when accompanied by alcohol abuse or dependence. A significant relationship between aggression and certain sociodemographic factors was demonstrated. The Cronbach's alpha (0.64) showed a strong link between the four aggression items, and the link between the different category of MOAS and PANSS by the chi-square test of independence showed a strong link between these two dimensions (chi-square = 20.57 and < 0.000). In addition, several studies have focused on the impact of testosterone on aggressive behavior; in fact, several researchers have found a strong significance between the increase in testosterone and the aggressiveness, while others demonstrate the opposite.

Violent or aggressive behaviors have been highlighted in schizophrenia patients particularly in symptomatic periods of the illness or in periods during which the patients were not receiving any psychotropic treatment. Psychotic symptoms thus represent a primary risk factor for violent behavior in schizophrenic patients, especially when it is the initial episode of the disorders. Several systematic analyses and meta-analyses have confirmed an association between violent behavior and schizophrenia [5].

Conclusion

Aggressive behavior is a frequent symptom of schizophrenia in studied population and poses many clinical challenges; the association of positive symptoms, such as ideas of persecution, is related to minor and severe risk of violent behavior, whereas negative symptoms are associated with low risk of severe violence. Ensuring staff receive proper training and maintaining a structured, calming environment are vital measures to mitigate violence and enhance outcomes, prioritizing safety for both patients and staff. Familiarity with treatment protocols equips clinicians to navigate challenges effectively, offering patients less invasive interventions and improved solutions. The most effective approach to mitigate aggression risk involves comprehensive treatment of schizophrenia itself. Utilizing assessment tools for evaluating agitation and hostility empowers psychiatrists to tailor treatment strategies, thereby reducing aggression risk.

Collaboration with patients is crucial, alongside a skilled staff capable of handling challenging scenarios. Staff adherence to protocols, refraining from personal reactions to patient behavior, and minimizing stimuli are crucial. Assessing substance and alcohol abuse when feasible further informs treatment decisions [38].

Abbreviations

MOAS	Modified Overt Aggression Scale
PANSS	Positive and Negative Syndrome Scale
DSM IV	Diagnostic and Statistical Manual of Mental Disorders
MDD	Major depressive disorder

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Authors' contributions
MC and AK, conceptualization and formal analysis; BE and IF, investigation and data curation; BE and AE, methodology; AK, supervision; and BE and MC, writing — review and editing.

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Availability of data and materials
The collected data were entered into statistical processing software, and the database of all parameters is available from the authors.

Declarations

Ethics approval and consent to participate
All the experimental protocols were approved by the administration of My EL Hassan health center. The patients who met the inclusion criteria were informed about the objectives of the study and the conditions of participation. The respect of anonymity and confidentiality of information was rigorous. The study does not expose the patient to any risk during the study, and the data entry of the patient does not contain his identity. Informed consent was obtained from the legal guardians of all subjects.

Consent for publication
Not applicable.

Competing interests
The authors declare that they have no competing interests.

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