

# Posttraumatic Stress Symptoms Among Patients with Chronic Medical Disease Amid Covid-19 Pandemic in Southwest Ethiopia

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**Abstract:** Background: During infectious disease pandemic, patients with chronic medical diseases were at increased risk of mental health problems. Therefore, the study assessed posttraumatic stress symptoms amid the COVID-19 pandemic among patients with chronic medical diseases. Methods: A facility-based cross-sectional study was conducted from August 1- 20, 2020. Systematic random sampling was used to select 422 patients with chronic medical diseases (diabetes, hypertension, and HIV). Impact of the event scale revised was used to assess posttraumatic stress symptoms. Data were analyzed by using SPSS version 23. Multivariable logistic regression analysis with 95% CI and odds ratio were fitted to declare the significantly associated variables at P value < 0.05. Results: 230 (54.5%) of the participants were reported to have posttraumatic stress symptoms. Being female, AOR=3.65 (95% CI 2.08, 6.40), Duration of illness greater than five-year AOR=3.12 (95% CI 1.73, 5.65), presence of anxiety AOR=6.52 (95% CI 3.71, 11.47), Age ≥55 year AOR=3.45 (95% CI 1.49, 7.98), diagnosis of diabetes AOR=7.49 (95% CI 3.65, 15.35), hypertension AOR=4.45 (95% CI 2.29, 8.64) and poor social support AOR=2.16 (95% CI 1.26, 3.68) were observed to have significant association with posttraumatic stress symptoms. Conclusion: Significant posttraumatic stress symptoms were reported by more than half of the patients with chronic medical diseases. This was of considerable concern indicating a significant impact of COVID-19 pandemic on this group, which seeks attention for early psychological intervention.

**Keywords:** Coronavirus Disease, Posttraumatic, Stress, Patients, Chronic Disease, Ethiopia

## 1. Introduction

Posttraumatic stress symptoms (PTSS) are psychological stress symptoms that occur when an individual experiences, witnesses, or confronted with either actual or imagined traumatic events, and characterized by a cluster of symptoms such as avoidance, intrusion, negative alterations in cognition and mood, and hyperarousal [1]. Evidence from recent studies suggests that infectious disease pandemic can be traumatic experience and people may experience PTSS and other chronic psychological disorder symptoms [2-4].

Traumatic events such as infectious disease pandemics

have an adverse effect on the psychological well-being of the population. Questions such as when it will come to an end, uncertainty about methods of treatment, particularly in the absence of vaccines or other effective medical treatments, exposure to a flow of information about the pandemic, and measures to combat the pandemic, all can adversely affect mental health and reduce feeling of security [2, 3, 5]. With this regard it can be said that COVID-19 appear to be a serious threat to the mental health around the globe and symptoms such as anxiety, depression, PTSD, sleep problems and negative societal behaviors are among the most frequently reported symptoms during the COVID-19

pandemic [4, 6–8].

COVID-19 related adverse socioeconomic consequences are impacting the psychological well-being of patients with COVID-19, health care workers, patients with preexisting physical or mental illness and a wider public [9]. Study carried out among COVID-19 patients reported up to 96.2% prevalence of posttraumatic stress symptoms [10].

Study carried out among healthcare workers revealed that about 71.5% of healthcare workers were found to have psychological distress [11]. Studies carried out in different countries among the general population reported about 4.6% to 35% prevalence rate of COVID-19-related posttraumatic stress symptoms [3, 4, 12–14].

While infectious disease pandemics remain highly stressful for almost all individuals, existing evidence suggests that individual differences may exist related to the development and severity of psychological impact based on risk factors such as the degree of exposure to the disease, gender, preexisting physical or psychological disease and age [4, 11, 12, 15]. Patients with chronic diseases constitute a highly vulnerable group during an infectious disease pandemic; nonetheless many psychological problems encountered by these patients are neglected even in routine clinical work [16].

Uncertainty over the disease status, which may present with complications and unpredictable course and difficulties in routine medical care due to delayed transportation, shortage of medications, and human resources are among the contributing factors for patients with chronic diseases to suffer from a range of mental health problems during infectious disease pandemic [2, 16–18].

Several studies have indicated that patients with chronic medical diseases such as cardiovascular disease, hypertension, and diabetes are at increased risk of developing severe symptoms of COVID-19 illness which could result in death [15, 19]. Due to the awareness of the possibility of death from the illness, patients with chronic diseases may experience feelings of strong fear and helplessness, which may lead to the development of posttraumatic stress symptoms (PTSS).

However, previous studies conducted on the psychological impact of COVID-19 were focused on the general population of adults, healthcare workers, and hospitalized or quarantined individuals, and so far limited studies have been investigated the mental health problem of patients with chronic diseases during covid-19 pandemic [20, 21]. A recent study during the outbreak of COVID-19 found that patients with chronic disease had higher levels of psychological distress [22]. Another study carried out in Turkey reported a 28% prevalence of posttraumatic stress symptoms among patients with Rheumatic Disease [15].

Previously carried out studies showed that HIV, diabetes, and hypertension represented conditions reported to be mostly impacted by the reduction in the healthcare system due to COVID-19 pandemic [23, 24]. Having this in mind, we aimed to assess PTSS among patients with these diseases. Patients with diabetes or hypertension may be considered as a high risk group for psychological stress symptoms than

patients with HIV related to the fact that Covid-19 appears to have substantial indirect risk to patients with diabetes or hypertension through interference with changes in lifestyle factors such as diet and physical activity which are considered the mainstays of treatment [25, 26]. Additionally, the high rate of comorbidity with diabetes or hypertension could let patients to heavily depend on several regular check-up which seems to be difficult in the context of the current pandemic, and this can give rise to several potential consequences including poor psychological health [23]. Despite this prevailing phenomenon, to the best of our knowledge, there were no prior studies reports on covid-19 related PTSS among patients with chronic diseases in Ethiopia. Therefore, the current study assessed the prevalence and predictors of PTSS among patients with chronic medical diseases at Mettu Karl referral hospital.

## 2. Methods

### 2.1. Study Design and Setting

Facility based cross-sectional study was carried out at Mettu Karl referral hospital from August 1 to 20, 2020. The hospital is found in Mettu, a zone city which is located about 600 km far in the southwest of Addis Ababa, the capital city of Ethiopia. The covid-19 pandemic has placed an extra burden on the highly centralized and less organized mental health services in the country with the overflow of patients to these limited centers [27]. Despite this, there are only two mental health hospitals in Ethiopia, and the number of psychiatrists, mental health nurses, and psychologists is about 0.08, 1.00, and 0.04 per 100,000 population respectively, with the majority of psychiatrists being concentrated in large cities. There are about 52 inpatient psychiatric units and 60 outpatient psychiatric units in the general and referral hospitals in the country [28].

### 2.2. Study Population

The Study Population was patients with diabetes, hypertension and HIV-AIDS, aged  $\geq 18$  years, and who visited the hospital during the study period. Patients with a history of mental illness receiving treatment and those who were critically ill or unable to respond because of the illness were excluded.

### 2.3. Sample Size and Sampling Technique

The sample size for the study was determined by using the single population proportion formula  $n = (Z \alpha/2)^2 P(1-P)/d^2$ . Considering 95% of confidence level, 5% margin of error, and assuming 50% prevalence of PTSS (since there was no similar study conducted in the area). Considering a 10% nonresponse rate, the final calculated sample size became  $n=422$ .

During the study period, on average a total of 2700 patients were on treatment at the hospital for diabetes mellitus ( $n=889$ ), hypertension ( $n=1113$ ), and HIV ( $n=698$ ). The sample was proportionally allocated, accordingly 139

patients with diabetes, 174 patients with hypertension, and 109 patients with HIV were recruited through systematic random sampling at every 6 intervals by using the order of their visit.

#### 2.4. Data Collection Procedure and Study Variables

Data were collected by trained nurses through face-to-face interviews using instruments translated to the local language Afaan Oromo and Amharic. One day training on the data collection instruments, data handling, and infection prevention protocol was provided to data collectors and supervisors. During interview, data collectors were tried to keep the safety of the respondents and themselves by wearing face masks, using alcohol rubbed hand sanitizers, and practicing social distancing of at least two meter [29].

The outcome variable was posttraumatic stress symptoms. Explanatory variables were age, sex, marital status, educational status, and occupation, place of residence, family size, perceived social support, and duration of illness, type of medical diagnosis, presence of chronic comorbid conditions, anxiety symptoms and current substance use.

The data collection instrument consisted of the following parts. Structured questionnaire was used to assess socio-demographic and clinical variables. Oslo 3 items perceived social support scale was used to assess perceived level of social support [30]. The tool was found to work well in this study with Cronbach  $\alpha=0.81$ . In this study, the mean score was used to categorize the social support perceived by the patient into strong and poor.

Impact of Event Scale revised (IES-R) was used to measure the psychological stress symptoms caused by the traumatic events [31]. It is a 22 item tool which scored on a five-point Likert scale with response option ranging from 0 (Not at all) to 4 (extremely). The tool yields a total score of 0-88 and the items can be separated in to three subscales; intrusion (8 items), avoidance (8 items), and hyperarousal (6 items). A cut-off point  $\geq 33$  was used to define PTSS in the current study [15]. The Cronbach  $\alpha$  coefficient of IES-R in the present study was found to be 0.86.

Anxiety was assessed by the anxiety sub-scale (HAD-A) of the Hospital Anxiety and Depression Scale. HAD-A has seven items which scored on four-point Likert scale from 0-3. The total score obtained was range from 0-21. This tool has been reported to have good internal consistency ( $\alpha=0.78$ ) for anxiety subscales at a score of  $\geq 8$ . In the present study, score  $\geq 8$  on HAD-A subscale was used to define probable case of anxiety [32].

Comorbid chronic diseases were assessed by structured questionnaire (Have you ever been told by health professionals to have a chronic disease other than this one?). Duration of illness was assessed by a structured questions (how long was the duration of your disease/illness last since you have been told to have this disease?).

Current substance use was assessed by asking the question: have you used khat, alcohol or tobacco in the recent three months. Regular physical activity or exercise was recorded yes if the participants responded yes to the question do you

take part in physical activity or exercise regularly?

#### 2.5. Data Analysis

Data were coded, entered in to Epi data v3.1, and analyzed by SPSS v23. The candidate variables for multivariable logistic regression analysis were selected at  $p \leq 0.25$  and based on the clinical importance of the variables as reported in prior studies. Multivariable logistic regression analysis with 95% CI and adjusted odds ratio was fitted to declare the significantly associated variable at P value  $< 0.05$ .

#### 2.6. Ethical Consideration

Ethical clearance was obtained from the ethical review board of Mettu University College of health Science. Permission letter was secured from Mettu Karl referral hospital administration. Written informed consent was obtained from each respondent after they were informed about the aims of the study, voluntary participation, and the right to participate or refuse. Information taken from the patient was kept confidential as much as possible.

### 3. Result

#### 3.1. Socio Demographic Characteristics of the Study Participants

A total of 422 participants were enrolled in the study with an overall response rate of 100%. Two hundred and twenty-three (52.8%) were males and the mean age was 43.74 (SD=13.30) years. Majority (94.8%) of the participants were married and self-employed (77.7%). (Table 1)

#### 3.2. Clinical and Psychosocial Factor Distribution of the Study Participants

More than half 236 (55.9%) reported to have poor social support and anxiety symptoms, 243 (57.6%) respectively. Two hundred and thirty one (54.7%) were reported to have engaged in physical activity or exercise on a regular basis and nearly half (49.3%) of them reported to have used khat in the recent three months (Table 2).

#### 3.3. Prevalence of PTSS Among Patients with Chronic Medical Diseases

The prevalence of PTSS among patients with chronic medical disease was 54.5% (95% CI 50.0, 59.2). The mean scores of the intrusion, avoidance, and hyperarousal symptoms were 12.88 (SD $\pm$  3.47), 12.60 (SD $\pm$ 4.19) and 7.28 (SD $\pm$ 2.93) respectively. More females 127 (63.8) than male 103 (46.2) were found to have posttraumatic stress symptoms. Posttraumatic stress symptoms were observed to be higher among patients reported to have poor social support 149 (63.1%) and anxiety symptoms 162 (66.7%). Patients with the duration of illness greater than five years 123 (66.8%), and who reported to have currently used alcohol 137 (74.1) and tobacco 38 (70.4%) were found to have higher PTSS than their counterparts.

**Table 1.** Socio-demographic characteristic distributions of patients with chronic medical disease at Mettu Karl referral hospital, Southwest Ethiopia, 2020 (N=422).

Variables	Category	Frequency (N)	Percent (%)
Sex	Male	223	52.8
	Female	199	47.2
Age in years	18-34	90	21.3
	35-54	215	50.9
	≥55	117	27.7
Marital status	Never married	22	5.2
	Married	400	94.8
Residence	urban	246	58.3
	Rural	176	41.7
Educational status	No formal	59	14.0
	primary	219	51.9
	Secondary and above	144	34.1
Occupation	Government employed	94	22.3
	Self employed	328	77.7
Family size	<4	216	51.2
	≥4	206	48.8

**Table 2.** Clinical and psychosocial factor distribution of patients with chronic diseases at Mettu Karl hospital, 2020 (N=422).

Variable	Category	Frequency (N)	Percentage (%)
Social support	poor	236	55.9
	Strong	186	44.1
Current khat use	No	214	50.7
	Yes	208	49.3
Current alcohol use	No	237	56.2
	Yes	185	43.8
Current tobacco use	No	368	87.2
	Yes	54	12.8
Anxiety symptoms	No	179	42.4
	Yes	243	57.6
Type of disease	Diabetes mellitus	139	32.9
	hypertension	174	41.2
	HIV-AIDS	109	25.8
Comorbid chronic illness	No	333	78.9
	Yes	89	21.1
Duration of illness	≤ 5	238	56.4
	> 5	184	43.6
physical activity	No	231	54.7
	Yes	191	45.3

### 3.4. Factors Associated with PTSS Among Patients with Chronic Medical Diseases

Binary logistic regression analysis showed that sex, age, marital status, educational status, occupation, type of primary diagnosis, presence of chronic comorbid disease, anxiety, duration of illness, regular physical activity, and current use of tobacco, khat and alcohol were explanatory variables found to have association with PTSS at  $p \leq 0.25$ .

Multivariate logistic regression analysis revealed that being female, AOR=3.65 (95% CI 2.08, 6.40) and presence of anxiety symptoms, AOR=6.52 (95% CI 3.71, 11.47) were significantly associated with PTSS. Patients with duration of illness greater than 5 years were about three times AOR=3.12 (95% CI 1.73, 5.65) more likely to report PTSS than their counterparts. Older age  $\geq 55$  year, AOR=3.45 (95% CI 1.49, 7.98), diagnosis of diabetes mellitus, AOR=7.49 (95% CI 3.65, 15.35) and hypertension AOR=4.45 (95% CI 2.29, 8.64) were found to have

significant association with PTSS. Patients with chronic medical diseases who reported to have poor social support was two times AOR=2.16 (95% CI 1.26, 3.68) more likely to be screened positive for PTSS than their reverses. PTSS was observed to be four times AOR=4.20 (95% CI 2.43, 7.24) higher among current alcohol users than nonuser (Table 3).

## 4. Discussion

The present study demonstrated that a significant proportion of (54.5%) patients with chronic medical diseases have PTSS which met the level of probable PTSD (scored  $\geq 33$  on IES-R). The finding was higher when compared to the study conducted among the general population in China 4.6%, 35% [12, 14], Italy 29.5% [3] and Mexico 27.7% [13]. The higher prevalence in the current study may be explained in part by the fact that patients with chronic medical diseases may represent a high risk group with a greater possibility of experiencing severe symptoms, which may further escalate

the psychological stress [16, 19, 22].

**Table 3.** Factors associated with PTSS among patients with chronic medical illness at Mettu Karl hospital, 2020 (N=422).

Variable	Category	PTSS		COR (95%CI)	AOR (95%CI)
		No N (%)	Yes N (%)		
Sex	Male	120 (53.8)	103 (46.2)	1	1
	Female	72 (36.2)	127 (63.8)	2.05 (1.39, 3.04)	3.65 (2.08, 6.40)*
Age	18-34	50 (55.6)	40 (44.4)	1	1
	35-54	106 (49.3)	109 (50.7)	1.28 (0.78, 2.11)	1.09 (0.55, 2.17)
	≥55	36 (30.8)	81 (69.2)	2.81 (1.58, 4.98)	3.45 (1.49, 7.98)*
Marital status	Never married	7 (31.8)	15 (68.2)	1.84 (0.73, 4.62)	2.23 (0.62, 8.00)
	Married	185 (46.3)	215 (53.8)	1	1
Educational status	No formal	23 (39.0)	36 (61.0)	1.65 (0.89, 3.06)	1.74 (0.66, 4.57)
	primary	95 (43.4)	124 (56.6)	1.38 (0.90, 2.10)	0.86 (0.39, 1.89)
	Secondary and above	74 (51.4)	70 (48.6)	1	1
Occupation	Government	56 (59.6)	38 (40.4)	1	1
	self	136 (41.5)	192 (58.5)	2.08 (1.30, 3.32)	1.72 (0.72, 4.10)
Family size	<4	106 (49.1)	110 (50.9)	1	1
	≥4	86 (41.7)	120 (58.3)	1.34 (0.91, 1.97)	0.96 (0.53, 1.72)
Type of disease	DM	49 (35.3)	90 (64.7)	4.84 (2.80, 8.35)	7.49 (3.65, 15.35)*
	HTN	64 (36.8)	110 (63.2)	4.52 (2.68, 7.62)	4.45 (2.29, 8.64)*
	HIV-AIDS	79 (72.5)	30 (27.5)	1	1
Other comorbidities	No	159 (47.7)	174 (52.3)	1	1
	Yes	33 (37.1)	56 (62.9)	1.55 (0.99, 2.51)	1.47 (0.75, 2.90)
Anxiety	No	111 (62.0)	68 (38.0)	1	1
	yes	81 (33.3)	162 (66.7)	3.26 (2.18, 4.88)	6.52 (3.71, 11.47)*
Social support	poor	87 (36.9)	149 (63.1)	2.22 (1.50, 3.28)	2.16 (1.26, 3.68)*
	Strong	105 (56.5)	81 (43.5)	1	1
Illness Duration	≤5	131 (55.0)	107 (45.0)	1	1
	>5	61 (33.2)	123 (66.8)	2.47 (1.65, 3.68)	3.12 (1.73, 5.65)*
physical activity	No	89 (38.5)	142 (61.5)	1	1
	yes	103 (53.9)	88 (46.1)	1.87 (1.26, 2.75)	1.32 (0.77, 2.27)
Current tobacco use	No	176 (47.8)	192 (52.2)	1	1
	Yes	16 (29.6)	38 (70.4)	2.17 (1.17, 4.04)	0.86 (0.34, 2.15)
Current khat use	No	103 (48.1)	111 (51.9)	1	1
	Yes	89 (42.8)	119 (57.2)	1.24 (0.84, 1.82)	1.63 (0.95, 2.80)
Current alcohol use	No	144 (60.8)	93 (39.2)	1	1
	Yes	48 (25.9)	137 (74.1)	4.42 (2.90, 6.72)	4.19 (2.43, 7.24)*

Notes: P<0.05, P<0.001, 1=reference category, HTN: hypertension, DM: diabetes mellitus

On the other hand, a higher prevalence rate than the current study was reported from a study conducted among patients with covid-19 [10] and healthcare workers [11]. The higher prevalence among patients with covid-19 and healthcare workers may be explained in part by the particular vulnerability of this group given their risk of exposure to the virus, and the related concerns about being infected or infecting others, shortages of resources such as personal protective equipment and concerns about their work which demand longer working hours [33].

It was found that Patients with diabetic (64.7%) and hypertension (63.2%) have higher PTSS than patients with HIV-AIDS (27.5%). It was previously reported that patients with diabetic represent a group with considerable posttraumatic stress symptoms, which warrants increased attention in clinical care and research [34]. In the context of covid-19, diabetic and hypertension represent the two conditions reported to be mostly impacted by the reduction in healthcare system due to the pandemic, and the pandemic seems to have an indirect risk to these diseases through change in life style factors [23, 25]. These could further exacerbate the psychological stress symptoms among patients with hypertension or diabetes.

Concerning the factors associated with PTSS, in line with previous studies [15, 35] PTSS were observed to be higher among females than males. Biological factors such as hormonal differences and social factors such as greater household responsibilities including more time devoted to child care and less time to enjoy activities may account for the differences [36].

Consistent with the finding from other studies [36, 37] poor social support was significantly associated with PTSS. Existing evidence indicated that social support has a buffering effect on mental health and lack of or poor social support were associated with an increased probability of developing a psychological problems including depression, anxiety, and PTSS after a traumatic event [36–38].

In agreement with other study [39] patients who used alcohol in the recent three months were about four times more likely to be screened positive for PTSS than their counterparts. It was reported previously that stress and substance use have a bidirectional relationship that stress can lead to the initiation or increment in the amount of substance use [40], and increasing the amount of substance use were associated with a wide range of health outcomes including mental health disorders [41].

The odds of having PTSS were about three times higher among older patients'  $\geq 55$  years when compared to young adults in the age range of 18-34 years. Issues such as fear of social isolation fear of becoming infected with COVID-19, the awareness of the possibility of having severe symptoms from the disease, and feelings of being a burden to the family may contribute to the higher PTSS among older adults [19, 20]. Similar finding was reported previously during post severe acute respiratory syndrome [42].

The study also demonstrated that patients with illness duration longer than five years had higher odds of PTSS. As the duration of illness increases, the resultant effect of the illness on the patient such as increasing pain, concerns related to treatment and its costs, complications, functional limitations, and disability could be increased and these all may further intensify psychological stress symptoms [43].

Concerning to the type of disease, patients with diabetic and hypertension were observed to have significant PTSS. Given patients with chronic disease experience ongoing stress related to the disease, what remained more stressful in the context of covid-19 was the fact that the healthcare system and routine daily activities were impacted by the pandemic outbreak [43, 44]. Moreover, the fact that diabetes and hypertension represent diseases that usually occur with comorbidity could also let those patients to experience more psychological stress.

Furthermore, in agreement with previous study [45] anxiety symptoms were found to be an independent predictor of PTSS. Consistent finding was reported in a previous study that those who encountered COVID-19 pandemic related traumatic stress are likely to suffer from a range of mental health problems including anxiety and depression [46].

Even though not covered in the current study, misinformation and disinformation are critical issues in the face of the current pandemic and may cause or exacerbate psychological stress among the public. In view of this, previously conducted studies have shown that poor quality information may in the future intensify anxiety to a state of panic, particularly in the occasion of a new wave of infections [47]. Prior studies have revealed that misinformation and exaggerated fake news could contribute to the onset of panic, anxiety, and other significant stress disorders among patients in particular and the wider public in general [48, 49].

The present study assessed PTSS and provided valuable insights to potential predictors of PTSS among patients with chronic disease. The finding could be helpful in the effort to improve psychosocial support for people with diabetes, hypertension, and HIV to manage their stress. However, the study has some notable limitations. Even though enormous efforts were made to include a lot of potential confounders, yet some variables such as depression, perceived threat, and history of exposure to or contact with covid-19 patients were not covered in this study. The possibility of social desirability bias was unavoidable as the study conducted using face to face interviews. Moreover, the study was carried out in a single facility and further studies are needed to address patients from multiple sites and to cover patients with other

chronic diseases. Studies are also needed to explore if there are any significant differences in PTSS among patients with different chronic diseases based on the number and type of comorbidities, and demographic factors such as age and sex. Post covid-19 researches on PTSD are needed in Ethiopia and should at least address covid-19 survivors, healthcare workers, and families of survivors.

## 5. Conclusion

Significant PTSS was reported by more than half of patients with chronic medical disease. This was of considerable concern indicating the significant traumatic impact of COVID-19 pandemic on patients with chronic medical diseases. Being female, older age, anxiety, diagnosis of diabetes and hypertension, current use of alcohol, longer duration of illness, and poor social support were found to be independently associated with PTSS.

## Authors' Contributions

MM, MAH, and AD involved in the inception of the idea, contributed to the design, organized the data collection process, involved in the formal analysis, drafted and critically reviewed the manuscript. JE contributed to the design involved in formal analysis and interpretation of the results and critically reviewed and edited the manuscript. All authors read and gave final approval of the version submitted and agree to be accountable for all aspects of the work.

## Data Availability

The datasets used and/or analyzed during the current study are included in the manuscript.

## Ethics Approval and Consent to Participate

Ethical clearance was obtained from the ethical review committee of Mettu University College of health Sciences, and the study was carried out in accordance with the principles of the Declaration of Helsinki. Permission was obtained from Mettu Karl referral hospital administration. Written informed consent was obtained from each respondent after they were informed about the aims of the study. Information taken from the patients was kept confidential as much as possible.

## Competing Interest

The authors declare that they have no competing interests.

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