

Original Article

One year retrospective epidemiological analysis of forensic cases admitted to emergency departments in Ordu, Türkiye**✉ Mehmet Seyfettin Saribas¹, Adem Koksall, Omer Yusuf Erdurmus²**¹Ordu University, Faculty of Medicine, Department of Emergency Medicine, Ordu, Türkiye²Ordu City Hospital, Department of Emergency Medicine, Ordu, Türkiye

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**Abstract****Aim:** This study aimed to evaluate the epidemiological characteristics of forensic cases admitted to the emergency departments of two public hospitals in Ordu, Türkiye, over a one-year period. The distribution of traumatic and non-traumatic forensic cases, demographic variables, and clinical outcomes were assessed.**Materials and Methods:** This retrospective observational epidemiological study included all emergency admissions with forensic records between 01 January and 30 November 2025. Age, sex, mechanism and type of injury, detailed clinical classification, and discharge/outcome parameters were analyzed. Data were processed using SPSS version 29.0, employing descriptive statistical methods and frequency analysis.**Results:** The majority of cases consisted of assault-related traumatic cases predominantly seen in young adult males. Assault related trauma remained the leading cause of forensic admission, particularly between the ages of 20–49 years. Occupational injuries were more frequent among the actively working population. Alcohol- and substance-related cases were markedly higher among males. Among non-traumatic forensic cases, poisoning showed a higher incidence in females. A pronounced upward trend in the incidence of forensic cardiac arrest cases was observed with increasing age.**Conclusion:** Assault related trauma constitutes the predominant type of forensic emergency admission, with young adult males identified as the most vulnerable demographic. The study underscores the necessity for risk-oriented forensic assessment, integration of multidisciplinary approaches in post-trauma care, and formulation of community-based prevention strategies.**Keywords:** Emergency department; epidemiology forensic science; trauma**INTRODUCTION**

Forensic cases comprise cases in which an individual's health deteriorates, injury occurs, or death ensues as a result of their own actions or those of others through intentional harm, negligence, carelessness, or lack of precaution. Such incidents require mandatory legal notification and include traffic accidents, assaults, occupational injuries, poisonings, burns, falls, suicide attempts, child abuse, firearm and sharp-object injuries, electrocution, and sexual assaults [1-3]. In the literature, these cases are commonly classified into two major categories: trauma-related cases (e.g., motor vehicle

collisions, assaults, occupational injuries, falls, firearm and sharp-object injuries) and non-traumatic forensic cases (e.g., poisonings, suicide attempts, child abuse, sexual assaults, electrocution, burns) [3-5]. Some studies propose more detailed subclassifications depending on the type and mechanism of the event [6,7].

Among forensic cases presenting to emergency departments, traffic accidents, assault-related injuries, and occupational accidents constitute the most frequently encountered cases. Non-traumatic forensic cases such as poisonings and burns also represent a substantial proportion of presentations [2,7-

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9]. The incidence of these cases exhibits considerable temporal variation influenced by the time of day, societal activity levels, and seasonal or situational fluctuations. Globally and in Türkiye, the rising trend in violence reflects the interplay of individual, social, economic, and cultural determinants. Alcohol and substance use, lower educational attainment, childhood trauma, psychiatric disorders, and personality traits elevate individual risk, whereas poverty, unemployment, traditional gender norms, insufficient social support, and inadequate legal sanctions contribute to broader societal vulnerability [10-13]. This multilayered structure became even more prominent during the COVID-19 pandemic, during which notable shifts were observed in both the total proportion and the types of forensic cases presenting to emergency departments.

Although overall emergency department visits decreased during the pandemic, multiple studies reported an increase in the proportion of forensic presentations within these visits [14,15]. During the same period, the mean age of forensic patients reportedly increased, alongside higher hospitalization rates and prolonged lengths of stay [15]. Furthermore, suicide attempts were found to rise more significantly among women, domestic violence escalated markedly, and accidental poisonings and corrosive substance ingestions in children became more common [16,17]. Collectively, these findings highlight the strong influence of social, environmental, and situational dynamics on forensic case patterns. Reassessing the characteristics of forensic cases in the post-pandemic period is therefore crucial for both public health and emergency department management.

The aim of this study is to analyze the epidemiological characteristics of forensic cases presenting to the emergency department in the post-pandemic period, to assess their distribution according to presenting complaints, types of trauma and to compare these findings with pre-pandemic literature in order to elucidate the impact of post-pandemic societal changes on the current profile of forensic cases.

MATERIAL AND METHODS

This retrospective, observational, and epidemiological study was conducted after obtaining approval from the Ordu University Clinical Research Ethics Committee (Date: 12.12.2025; No: 421). Study data were retrieved from the emergency department information management systems of two state hospitals located in the city center of Ordu one tertiary-level and one secondary level facility. All patients who presented to the emergency departments of these two hospitals between 01.01.2025 and 30.11.2025 and had a forensic case record generated were included in the study. Presentations without a forensic record and cases with incomplete or inconsistent data were excluded. All emergency department admissions during the study period were electronically screened to identify forensic cases.

For each patient, the following variables were recorded retrospectively. The data collection form consisted of three main categories:

1. **Demographic variables:** age, sex, and date of presentation.
2. **Primary cause of presentation:** in-vehicle traffic accident, out-of-vehicle traffic accident, suicide attempt, assault related trauma presenting as penetrating or blunt injury, and occupational injury.
3. **Detailed clinical classification:** based on patients' medical histories and clinical notes documented at emergency presentation. Cases were further subclassified as intra-abdominal penetrating injury, fall from height, thoracic trauma related to motor vehicle accidents, blunt abdominal trauma, or combined/multisystem trauma types.

For cases in which multiple forensic factors coexisted, classification was based on the primary reason for emergency department presentation and the principal forensic event requiring legal notification. Accordingly, cases presenting due to interpersonal assault were categorized as assault-related trauma, even if concomitant alcohol or psychoactive substance use was documented in the victim and/or the perpetrator. Alcohol-substance-related cases were defined as presentations in which intoxication itself constituted the primary reason for admission in the absence of an accompanying traumatic or assault-related event. This approach was adopted to ensure consistency in categorization and to minimize misclassification bias in category-based analyses. Additionally, discharge status, hospitalization, and mortality (exitus) outcomes were recorded for all cases.

Statistical Analysis

All statistical analyses were performed using the Statistical Package for the Social Sciences version 29.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were used to evaluate the distribution of variables. Continuous data were expressed as mean $\pm$ standard deviation, whereas categorical variables were presented as number (n) and percentage (%).

RESULTS

A total of 13,722 forensic cases presenting to the emergency departments in Ordu province during the year 2025 were evaluated. The mean age of the patients was 34.6 ± 15.7 years, and the majority were male (77%; $n = 10,569$). Female patients accounted for 23% ($n = 3,153$) of all presentations. Age distribution indicated a marked concentration in young and middle-aged adults, with the highest frequency observed in the 20–29-year age group (26.5%), followed by the 30–39 (22.5%) and 40–49 (17.7%) age groups. Pediatric cases constituted a small proportion (2.9%), whereas the number of cases decreased progressively in older age groups. Cases above 100 years of age represented only 0.01% of all presentations. The distribution of cases by age decades is presented in Figure 1.

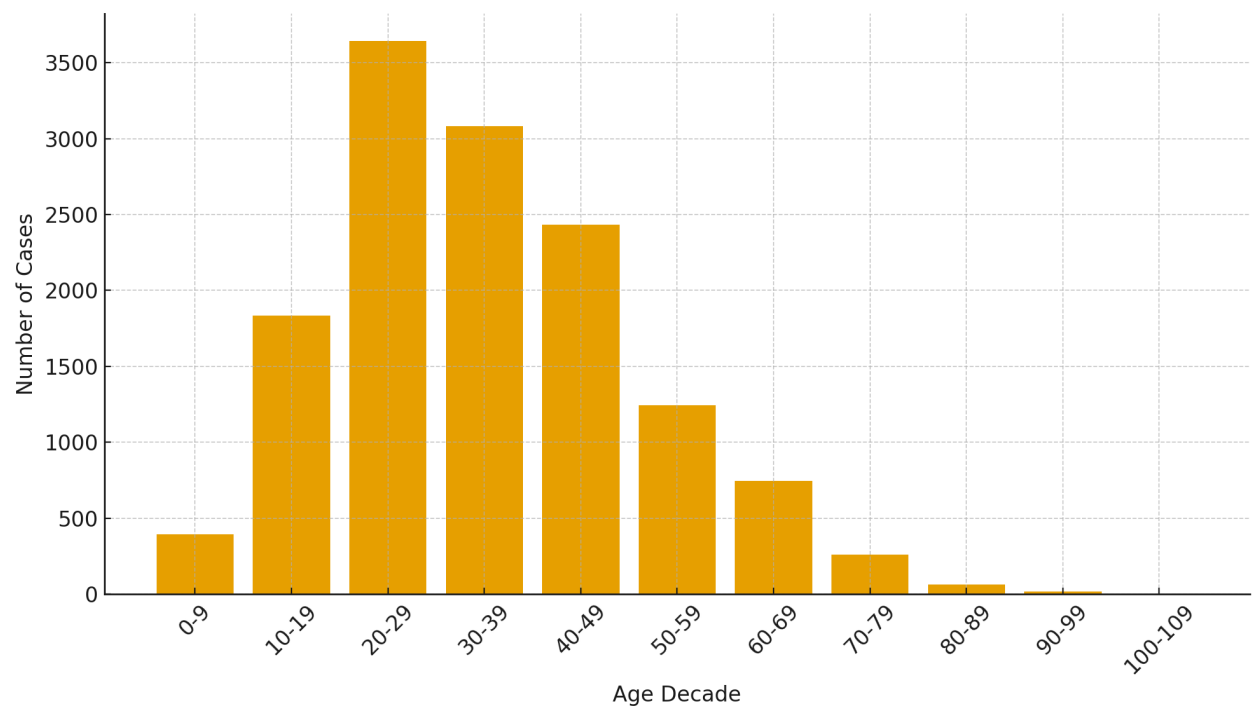


Figure 1. Distribution of cases by age decade.

Analysis of forensic event types revealed that assault was by far the most common cause, accounting for 73.9% (n = 10,139) of all cases. In accordance with the predefined classification strategy, cases involving assault were categorized under assault-related trauma regardless of concomitant alcohol or substance use, provided that intoxication was not the primary reason for presentation. Assault was followed by occupational injuries (5.8%), falls (5.8%), alcohol- and substance-related presentations (3.8%),

and other forensic cases (3.5%). Traffic accidents (2.3%), food and chemical poisonings (2.4%), and carbon monoxide exposure (0.36%) were less frequently observed. High-mortality cases such as hanging, burns, and drowning occurred at rates below one per thousand. Forensic cases presenting with cardiac arrest constituted 0.12% of all admissions. The distribution of presentation types is shown in Figure 2, and the demographic characteristics along with overall forensic event categories are summarized in Table 1.

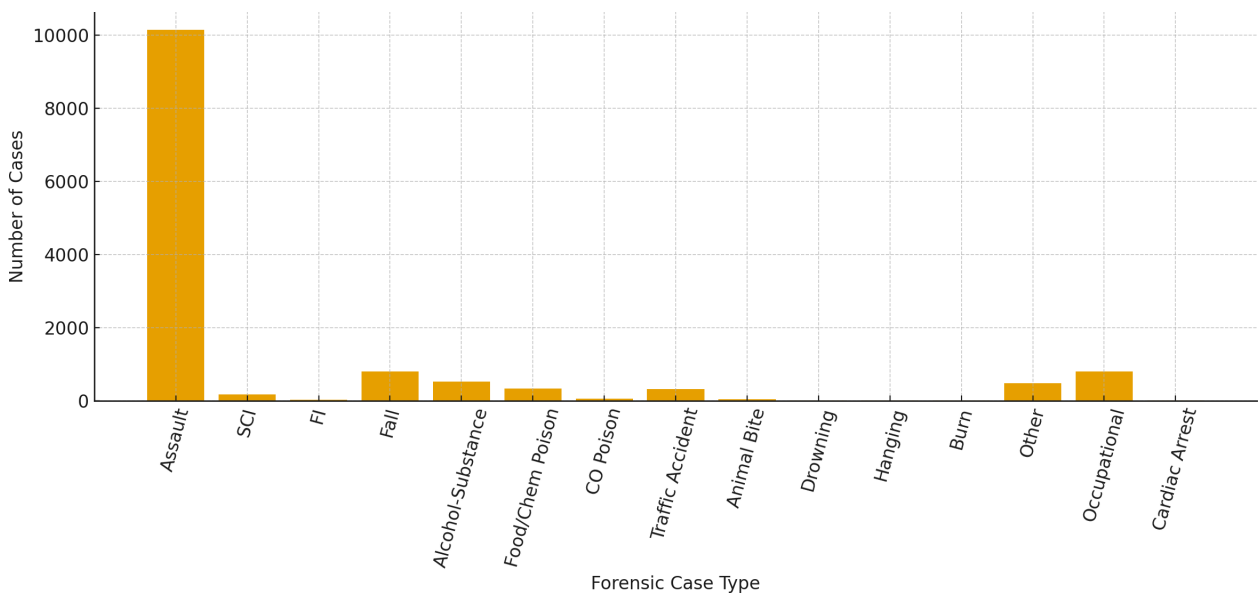


Figure 2. Distribution of cases by reason for presentation.

Table 1. Demographic characteristics of the study population and overall distribution of forensic case types

Variable	Value
Age	34.58 ± 15.70
Female	3153 (23%)
Male	10569 (77%)
0–9 years	395 (2.88%)
10–19 years	1836 (13.38%)
20–29 years	3642 (26.54%)
30–39 years	3082 (22.46%)
40–49 years	2432 (17.72%)
50–59 years	1242 (9.05%)
60–69 years	747 (5.44%)
70–79 years	261 (1.90%)
80–89 years	64 (0.47%)
90–99 years	19 (0.14%)
100–109 years	2 (0.01%)
Assault	10139 (73.89%)
SCI	178 (1.30%)
FI	28 (0.20%)
Fall	797 (5.81%)
Alcohol–substance use	521 (3.80%)
Food/chemical poisoning	327 (2.38%)
Carbon monoxide poisoning	50 (0.36%)
Traffic accident	313 (2.28%)
Animal bites	35 (0.26%)
Drowning	16 (0.12%)
Hanging	7 (0.05%)
Burn	16 (0.12%)
Other	477 (3.48%)
Occupational injury	801 (5.84%)
Cardiac arrest	17 (0.12%)

Abbreviations: FI, firearm injury; SCI, stabbing/cutting injury.

Sex-based analysis demonstrated marked differences across forensic categories. Male predominance was evident in assaults, traffic accidents, occupational injuries, and alcohol–substance-related presentations, with male ratios ranging between 70% and 90%. Notably, 89.3% of all alcohol–substance-related cases

were male. In contrast, food and chemical poisonings exhibited a female predominance, with women accounting for 52% of cases—the only forensic category in which female patients outnumbered males. Among forensic cardiac arrest presentations, the proportion of female patients was higher compared with other categories (58.8%). The sex-specific distribution of forensic case types is detailed in Table 2.

Table 2. Distribution of forensic case types by sex

Forensic case type	Female n (%)	Male n (%)
Assault	2095 (20.66)	8044 (79.34)
SCI	35 (19.66)	143 (80.34)
FI	3 (10.71)	25 (89.29)
Fall	263 (33)	534 (67)
Alcohol–substance use	56 (10.75)	465 (89.25)
Food/chemical poisoning	170 (51.99)	157 (48.01)
Carbon monoxide poisoning	26 (52)	24 (48)
Traffic accident	67 (21.41)	246 (78.59)
Animal bites	10 (28.57)	25 (71.43)
Drowning	5 (31.25)	11 (68.75)
Hanging	3 (42.86)	4 (57.14)
Burn	3 (18.75)	13 (81.25)
Other	151 (31.66)	326 (68.34)
Occupational injury	256 (31.96)	545 (68.04)
Cardiac arrest	10 (58.82)	7 (41.18)

Abbreviations: FI, firearm injury; SCI, stabbing/cutting injury.

Age-decade analysis demonstrated significant variation in forensic event types across age groups. Although assault was the most common event in all decades, it was particularly dominant in individuals aged 20–49 years, exceeding 75% in these groups. Falls exhibited a biphasic pattern: the proportion was highest in children aged 0–9 years (40%), declined during young adulthood, and increased again in individuals aged ≥70 years. Alcohol- and substance-related presentations peaked in the 30–39-year group, reaching 5.8%. Poisonings remained uncommon across all decades but showed a relative increase in the 50–59-year age group. Carbon monoxide exposure and traffic accidents were generally rare; however, carbon monoxide cases clustered particularly in the 40–69-year age range. Occupational injuries were markedly concentrated in the 20–29-year decade (8.4%), reflecting the risk profile of the working-age population. Cardiac arrest presentations increased with age, peaking at 2.7% in the 70–79-year group. Detailed age-decade distributions for all forensic categories are presented in Table 3.

Table 3. Distribution of forensic case types by age decades

Forensic case types	Decade																					
	0-9 years		10-19 years		20-29 years		30-39 years		40-49 years		50-59 years		60-69 years		70-79 years		80-89 years		90-99 years		100-109 years	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Assault	149	37.72	1382	75.27	2739	75.21	2431	78.88	1871	76.93	953	76.73	469	62.78	125	47.89	15	23.44	5	26.32	0	0.00
SCI	9	2.28	31	1.69	45	1.24	34	1.10	23	0.95	15	1.21	18	2.41	2	0.77	1	1.56	0	0.00	0	0.00
FI	0	0.00	4	0.22	5	0.14	5	0.16	5	0.21	6	0.48	2	0.27	0	0.00	1	1.56	0	0.00	0	0.00
Fall	158	40.00	186	10.13	77	2.11	71	2.30	70	2.88	68	5.48	89	11.91	49	18.77	20	31.25	8	42.11	1	50.00
Alcohol-substance use	1	0.25	21	1.14	172	4.72	180	5.84	97	3.99	36	2.90	9	1.20	5	1.92	0	0.00	0	0.00	0	0.00
Food/chemical poisoning	2	0.51	24	1.31	95	2.61	60	1.95	59	2.43	47	3.78	21	2.81	13	4.98	5	7.81	1	5.26	0	0.00
Carbon monoxide poisoning	0	0.00	3	0.16	7	0.19	4	0.13	13	0.53	4	0.32	9	1.20	5	1.92	5	7.81	0	0.00	0	0.00
Traffic accident	35	8.86	51	2.78	50	1.37	42	1.36	34	1.40	27	2.17	45	6.02	21	8.05	6	9.38	2	10.53	0	0.00
Animal bites	8	2.03	4	0.22	4	0.11	4	0.13	5	0.21	2	0.16	5	0.67	3	1.15	0	0.00	0	0.00	0	0.00
Drowning	1	0.25	11	0.60	1	0.03	2	0.06	0	0.00	1	0.08	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Hanging	0	0.00	1	0.05	3	0.08	3	0.10	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Burn	3	0.76	3	0.16	4	0.11	0	0.00	3	0.12	1	0.08	1	0.13	1	0.38	0	0.00	0	0.00	0	0.00
Other	27	6.84	51	2.78	131	3.60	75	2.43	60	2.47	39	3.14	50	6.69	30	11.49	10	15.63	3	15.79	1	50.00
Occupational injury	2	0.51	63	3.43	306	8.40	170	5.52	190	7.81	42	3.38	28	3.75	0	0.00	0	0.00	0	0.00	0	0.00
Cardiac arrest	0	0.00	1	0.05	3	0.08	1	0.03	2	0.08	1	0.08	1	0.13	7	2.68	1	1.56	0	0.00	0	0.00
Abbreviations: FI, firearm injury; SCI, stabbing/cutting injury.																						

Abbreviations: FI, firearm injury; SCI, stabbing/cutting injury.

DISCUSSION

In this study, the epidemiological characteristics of 13,722 forensic cases presenting to the emergency department in the post-pandemic period were evaluated. Assault related trauma constituted the predominant cause of presentation (73.9%), particularly among young adult males. This distribution indicates that trauma-related forensic cases remain the most prominent category in emergency care and highlights the influence of both social dynamics and individual risk factors. Previous studies have similarly reported assault as the leading cause of forensic admissions [7-9]. The literature suggests that violent behavior is shaped by a complex interaction of individual factors such as alcohol or substance use, psychiatric conditions, and personality traits—and broader sociocultural determinants [10-13].

The marked dominance of the 20–49-year age group (67%) reflects the increased exposure to trauma associated with active social engagement and workforce participation. Consistent with this finding, occupational injuries were most frequent in individuals aged 20–29 years, corresponding to the peak working-age cohort [2,3,9]. The substantially higher proportion of males in alcohol- and substance-related presentations further supports the association between alcohol use, impaired behavioral control, and increased aggression or violence [10-12].

Among non-traumatic forensic cases, the higher proportion of women in food and chemical poisonings is noteworthy. Several studies have reported that women are more frequently affected by domestic and environmental exposures [1,4]. Pediatric cases comprised a small proportion of overall forensic presentations (2.9%), consistent with previous reports [1,5]. However, the predominance of fall-related injuries in the 0–9-year age group underscores the vulnerability of children to household accidents.

In the post-pandemic period, the persistence of assault related trauma presentations observed in this study aligns with prior reports indicating that, although overall emergency department utilization decreased during the pandemic, the relative proportion of forensic cases increased [14,15]. Studies have also documented pandemic-associated rises in suicide attempts among women and increases in domestic assault related trauma incidents [16,17]. Although suicide attempts were infrequent in our cohort, this may point toward differential psychosocial impacts of the pandemic on specific demographic subgroups. Our findings additionally showed that forensic presentations involving cardiac arrest increased progressively with age, reaching the highest rates among older adults a pattern consistent with the expected rise in age-related mortality risk [8]. These observations suggest that age-specific prevention and intervention strategies may play an important role in reducing the burden of forensic morbidity.

In summary, this study demonstrates that in the post-pandemic era, forensic cases presenting to the emergency department are predominantly assault related trauma, disproportionately affect males and young adults, and are strongly influenced by

underlying social dynamics. These findings underscore the need to update emergency department forensic case management protocols, develop targeted prevention strategies for high-risk groups, and strengthen multidisciplinary approaches to the evaluation and management of trauma and assault related trauma presentations [8,9,14].

Limitations

This study has several limitations that should be acknowledged. First, its retrospective design may have resulted in incomplete data entries or documentation-related inaccuracies, which could have influenced the classification and interpretation of forensic cases. Second, forensic categorizations were based on clinicians' emergency department records, and variations in clinical judgment, documentation habits, and medico-legal awareness among physicians may have introduced classification bias. In addition, differences in institutional workflows and forensic documentation practices between hospitals may have contributed to variability in case recording, reflecting the lack of a fully standardized forensic reporting system across clinicians and healthcare institutions.

Furthermore, important potential confounders such as psychosocial stressors, alcohol consumption patterns, socioeconomic status, and contextual environmental factors at the time of the incident could not be evaluated due to the nature of the available data. The study was conducted in two public hospitals within a single province, which may limit the generalizability of the findings to other regions with different demographic and institutional characteristics. Finally, as the analysis focused exclusively on the post-pandemic period without a direct pre-pandemic comparison group, the specific magnitude of pandemic-related effects on forensic case patterns could not be definitively quantified.

CONCLUSION

This study provides an overview of the epidemiological characteristics of forensic cases presenting to the emergency department in the post-pandemic period. Assault related trauma among young adult males represented the most frequent cause of forensic admissions, while occupational injuries were notably concentrated in the productive working-age population. The predominance of males in alcohol- and substance-related cases underscores the relevance of behavioral risk factors. In contrast, the higher proportion of women in poisoning cases suggests differences in social roles and exposure patterns.

These findings highlight the need to strengthen preventive programs, enhance community-based strategies to reduce violence, and ensure that forensic case evaluations in emergency departments are conducted in accordance with standardized clinical protocols. The study results may guide the development of post-pandemic health policies and emergency department-based prevention strategies aimed at mitigating forensic morbidity.

Conflict of Interests

The authors declare that there is no conflict of interest in the study.

Financial Disclosure

The authors declare that they have received no financial support for the study.

Ethical Approval

Ethical approval for this study was obtained from the Ordu University Non-Interventional Scientific Research Ethics Committee (Date: 12.12.2025; No: 421).

Patient Consent

Not necessary for this manuscript.

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