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CHARACTERIZATION OF MORTALITIES REQUIRING AUTOPSY BY A MEDICAL BOARD

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ABSTRACT

Background

In general, a single autopsy surgeon undertakes medico-legal autopsies; nonetheless, in particular scenarios, a collaboration of medical experts may occur. This study aims to characterize the mortalities necessitating medicolegal autopsies by a Medical Board over an extended timeframe, thereby facilitating the development of a comprehensive profile of such cases pertinent to this region.

Methods

A cumulative total of 262 records about post-mortem examinations performed by Medical Boards from April 2015 to March 2020 were acquired after the fulfillment of our established criteria through the method of consecutive sampling in this retro-prospective observational study, which was executed within the Department of Forensic Medicine and Toxicology at the Rajendra Institute of Medical Sciences, Ranchi.

Results

In 17 cases (6.5%), the identification of the deceased individual could not be ascertained. A total of 5.3% (14) of the cases exhibited a considerable degree of decomposition. The majority of the autopsies [19.5% (51)] were conducted on individuals within the 21 to 30 years age demographic, comprising 212 males and 47 females. Nearly half, specifically 46.6% (122), of the autopsies were carried out on individuals identified as adherents of Hinduism, whilst 34.0% (89) were performed on adherents of the Sarna faith. Out of all autopsies, over half, accounting for 55.3% (145), were done on non-tribal people, contrasting with 38.2% (100) that were on tribal people. A significant majority, amounting to 74.0% (194), of the autopsies were conducted on individuals who were married.

Conclusion

The majority of the autopsies were conducted within the younger demographic strata, exhibiting a significant predominance of male subjects alongside a remarkable scarcity of unidentified and decomposed remains.

Recommendations

Comprehensive protocols are essential to guarantee that the performance of autopsies by Medical Boards upholds the trust and dependence of legal entities.

Keywords: *Mortalities, Medico-legal autopsy, Medical Board, Forensic Medicine, Autopsy surgeon*
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INTRODUCTION

Medico-legal autopsies are key to the discipline of forensic medicine, satisfying the demands of both legal systems and medical insights. The performance of these autopsies supports a detailed investigation into the deceased, allowing for the identification of the cause and nature of their passing. This process holds particular significance in instances of abrupt or unaccounted-for fatalities, wherein rudimentary morphological assessments may yield inconclusive results [1]. Such examinations are conducted by the stipulations set forth by state medical examiners, coroners' acts, or other official legislative frameworks, thereby ensuring that the resultant findings possess legal validity and can assist in judicial processes, as they are frequently mandated by law in cases involving non-natural deaths [2]. This legal infrastructure guarantees that the findings derived from the autopsy are permissible in judicial settings and can be utilized in criminal prosecutions, civil litigations, and various other legal contexts [3][4].

The data derived from medicolegal autopsies possess the capacity to elucidate societal patterns, including the incidence of specific diseases or the ramifications of lifestyle choices on overall health. Such knowledge is indispensable for policymakers aiming to establish health initiatives grounded in empirical evidence [5]. The methodology and importance of medicolegal autopsies are complex, engaging a diverse array of stakeholders and approaches. These autopsies frequently uncover incidental pathologies or conditions that remained undiagnosed during the individual's lifetime. Such discoveries possess not only academic importance but

also the potential to guide public health initiatives and familial health assessments [6].

Secondary autopsies, albeit infrequent, are occasionally performed to validate or challenge the initial findings. These procedures are technically demanding and necessitate the expertise of seasoned autopsy practitioners in which the primary autopsy surgeon should be engaged in full collaboration to guarantee the precision and dependability of the results [7]. There also exists an ongoing discourse regarding the necessity of routine histopathological evaluations or whether they impose an excessive burden on pathologists and the legal framework [8].

While medicolegal autopsies are essential for both legal and medical objectives, they encounter various obstacles, including diminishing rates and the necessity for specialized training. The COVID-19 pandemic exacerbated the circumstances by diminishing the quantity of autopsies conducted owing to safety apprehensions and limitations in resources [9]. The hesitance exhibited by family members to authorize autopsies, coupled with the perceived adequacy of contemporary diagnostic methodologies, along with the potential legal ramifications, are significant contributors to this observed decline [10]. Furthermore, the disinterest manifested by certain pathologists and the logistical obstacles associated with the execution of autopsies exacerbate the complexity of the issue [11]. Notwithstanding these impediments, autopsies continue to serve as an essential element within medical education and legal inquiries, highlighting the imperative for sustained advocacy and innovation within this domain.

The execution of autopsies by a consortium of medical professionals, particularly within medico-legal frameworks, constitutes a sophisticated and multifarious undertaking. This process encompasses a variety of factors, including legal, educational, and procedural dimensions. Autopsies are indispensable in ascertaining the etiology of death, particularly in instances that are dubious or deviant from the norm, and may necessitate a collective of medical professionals to guarantee comprehensive and precise results. The participation of diverse specialists, including autopsy surgeons, toxicologists, and geneticists, facilitates a more nuanced and accurate evaluation. This interdisciplinary methodology is imperative for the incorporation of advanced technologies, such as pharmacogenetics, which can elucidate intricate cases [5].

Medico-legal autopsies are conventionally performed by a solitary autopsy surgeon; however, in specific instances, such as deaths resulting from dowry disputes or custodial settings, a collaborative panel of physicians may be engaged. This occurrence is predominantly attributable to administrative directives rather than established protocols, underscoring the necessity for explicit guidelines to facilitate justice and mitigate the potential exploitation of autopsy surgeons. The participation of multiple physicians can significantly augment the credibility and comprehensiveness of the autopsy report, which is indispensable in judicial proceedings. Nevertheless, the absence of standardized criteria for the establishment of such panels may result in discrepancies and possible legal complications [12][13].

Law enforcement agencies and local governmental bodies have exhibited discrepancies in the allocation of resources, which has prompted claims of administrative power abuse in numerous instances. Numerous defendants have also articulated allegations of political interference in various locations. Furthermore, the routine conduct of histopathological examinations in all instances may not be imperative, as such evaluations do not invariably influence the elucidation of the cause or manner of death [14]. Consequently, although the engagement of a medical board enhances the caliber of autopsy procedures, it is essential to formulate explicit guidelines and optimize resource utilization to guarantee both efficiency and effectiveness.

The establishment of a Medical Board to conduct medico-legal autopsies invariably results in the strain of our finite resources and the imposition of excessive burdens on the system. Consequently, this phenomenon engenders unwarranted delays in the processing of such autopsies in numerous jurisdictions. Therefore, the criteria governing Board autopsies must be meticulously refined and rendered more objective.

There exists a paucity of extensive studies conducted in this area within the nation, with even fewer having been executed in the state of Jharkhand. This study aims to characterize the mortalities necessitating medicolegal autopsies by a Medical Board over an extended timeframe, thereby facilitating the development of a comprehensive profile of such cases pertinent to this region.

METHODOLOGY

Study design

The study was a retro-prospective, record-based observational study

Study Location

This study was executed within the Department of Forensic Medicine and Toxicology at Rajendra Institute of Medical Sciences, Ranchi.

Study Duration

The records related to post-mortem examinations performed by Medical Boards from April 2015 to March 2020 were procured and included in the study after a thorough verification of their completeness.

Inclusion and exclusion criteria

All autopsies that required the establishment of a medical board during the designated five-year timeframe were included in this study. Records that were incomplete and non-compliant, which posed challenges for interpretation, were excluded.

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Data Analysis

A cumulative total of 262 records were acquired for the five-year interval after fulfilling our specified criteria through a method of consecutive sampling. A case report form was meticulously developed at the inception of the study to facilitate data collection, following a comprehensive review of the existing literature.

Statistical Analysis

Data was systematically entered, and a corresponding template was constructed utilizing Microsoft Office Excel. Then, the dataset went through a meticulous examination leveraging the Statistical Package for Social Sciences (SPSS) that works with Windows.

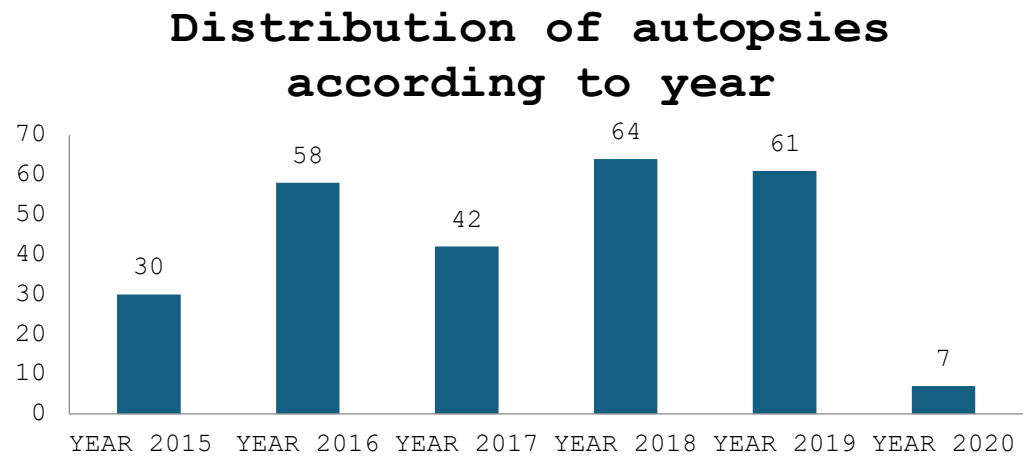
Ethical Consideration

The Institutional Ethics Committee from Rajendra Institute of Medical Sciences, which is in Ranchi, Jharkhand, approved the ethical aspects of the investigation. No personal identifiers were employed during the processes of data acquisition, documentation, or analysis to ensure the utmost confidentiality of the gathered information.

RESULTS

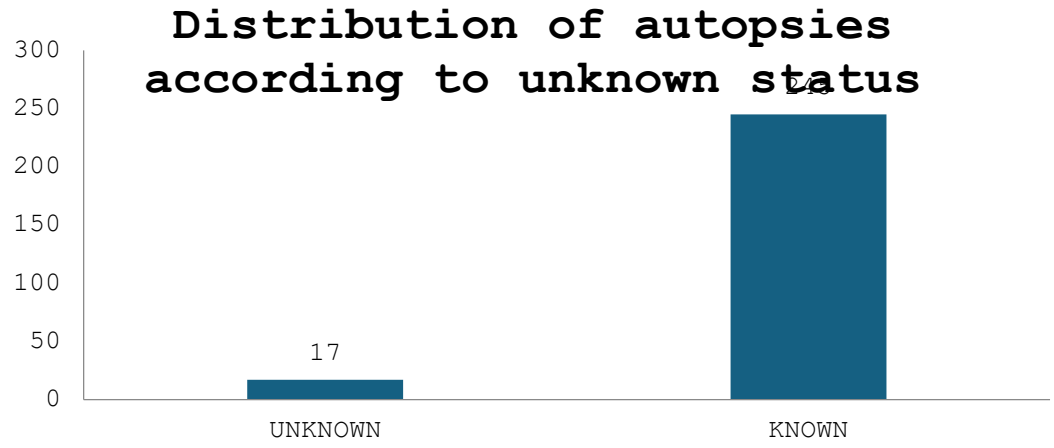
In the current retro-prospective analysis conducted within the Department of Forensic Medicine and Toxicology at RIMS, Ranchi, a comprehensive compilation of 262 records was amassed and scrutinized. The findings and observations were delineated as follows.

Figure 1: Bar diagram showing the year-wise distribution of autopsies performed (n=262)



(Figure 1) The highest frequency of autopsies conducted under the auspices of the medical board occurred in the calendar year 2018.

Figure 2: Bar diagram showing the distribution of autopsies performed according to unknown status (n=262)



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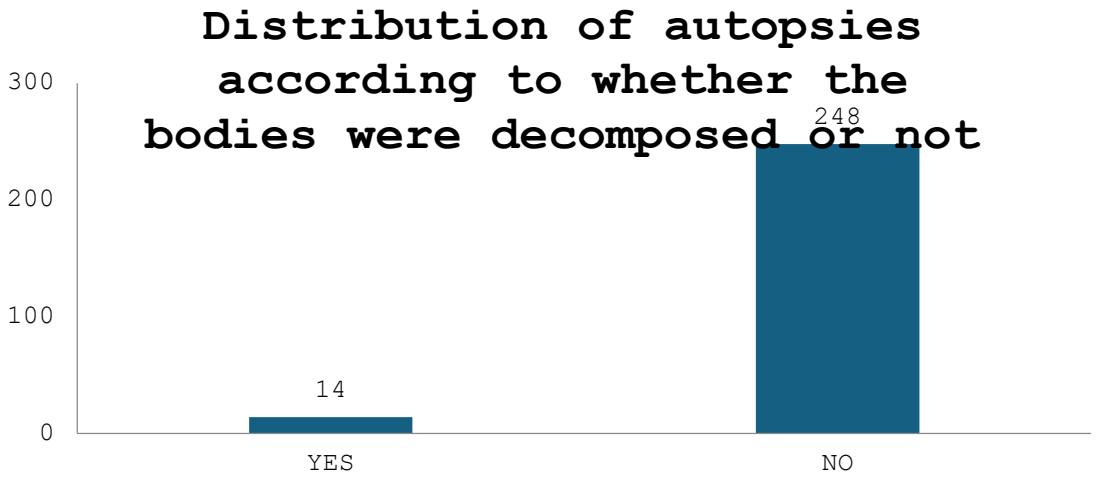
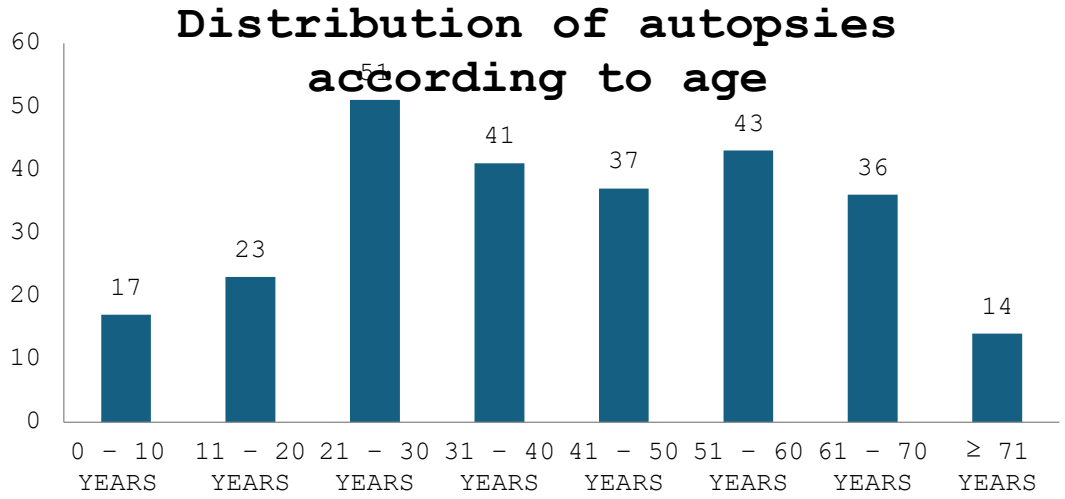
(Figure 2) A mere 6.5% (17) of the autopsies conducted pertained to individuals with unknown status.

Figure 3: Bar diagram showing the distribution of autopsies according to whether the bodies were decomposed or not (n=262)



(Figure 3) Only 5.3% (14) of the autopsies performed were carried out on a cadaver displaying considerable decomposition.

Figure 4: Bar diagram showing the age-wise distribution of autopsies performed (n=262)



(Figure 4) A significant proportion of the autopsies, 19.5% (51), were conducted on individuals within the age group of 21 to 30 years.

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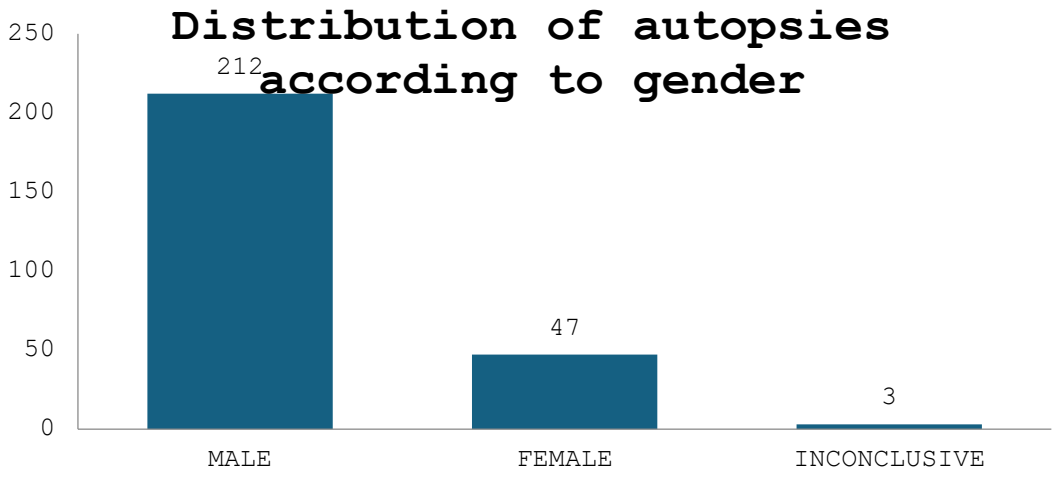
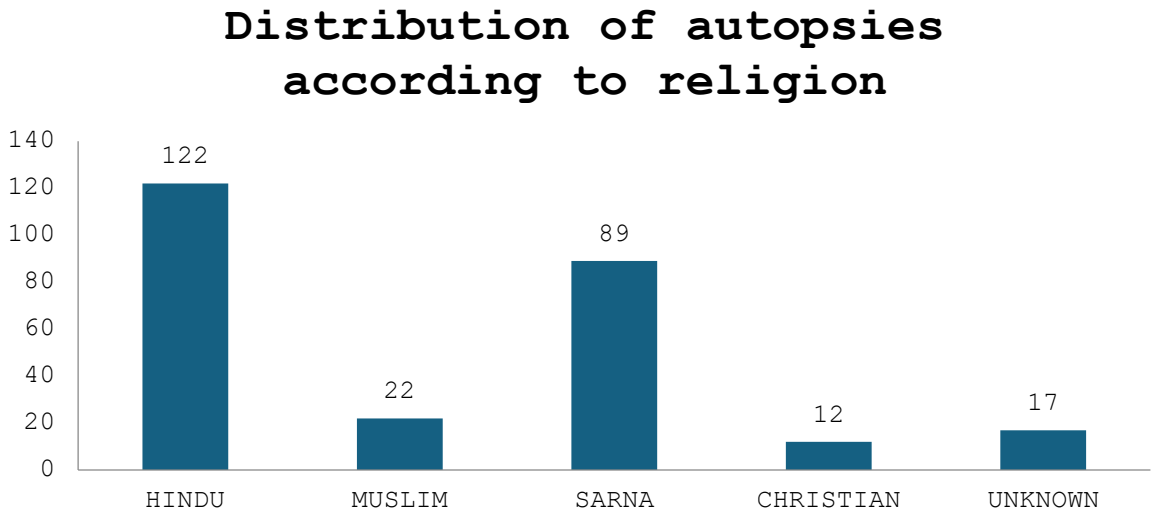
Figure 5: Bar diagram showing the gender-wise distribution of autopsies performed (n=262)



(Figure 5) In the present examination, a dominant share, precisely 80.9% (212) of the autopsies, involved male subjects, while the leftover 17.9% (47) were associated with female subjects. In 1.2% (3) of the instances, the biological sex remained indeterminate, as these situations pertained to malformed fetuses
.

Figure 6: Bar diagram showing the distribution of autopsies performed according to religion (n=262)



(Figure 6) Nearly half, constituting 46.6% (122), of the conducted autopsies were executed on individuals identifying as Hindu, whereas 34.0% (89) were carried out on individuals adhering to the Sarna faith.

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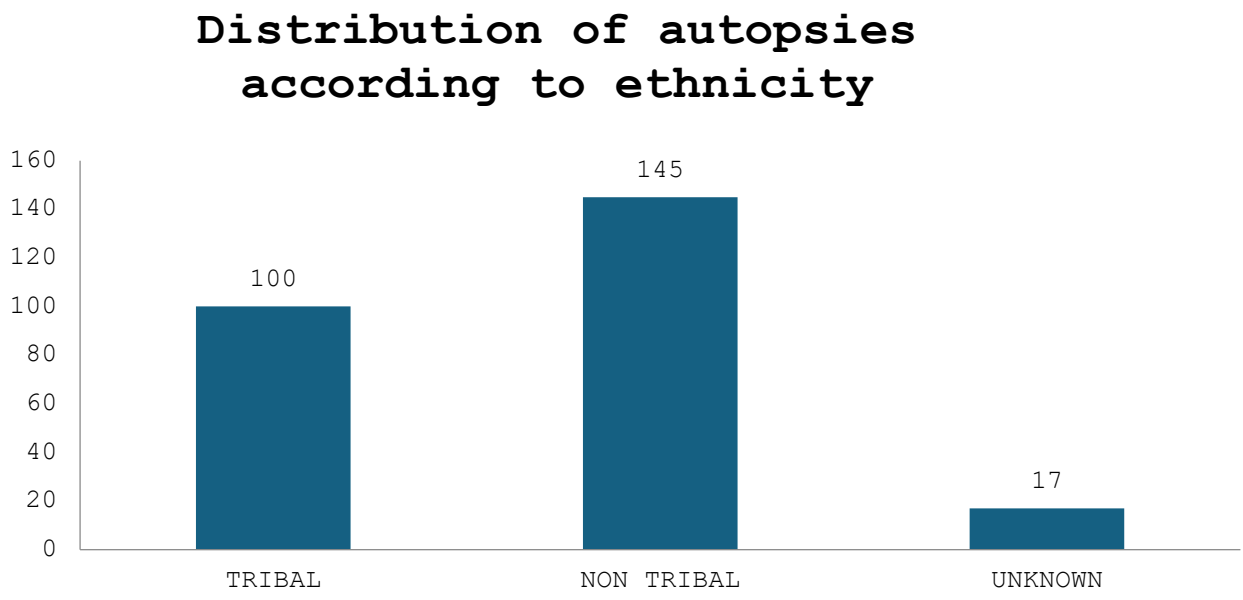
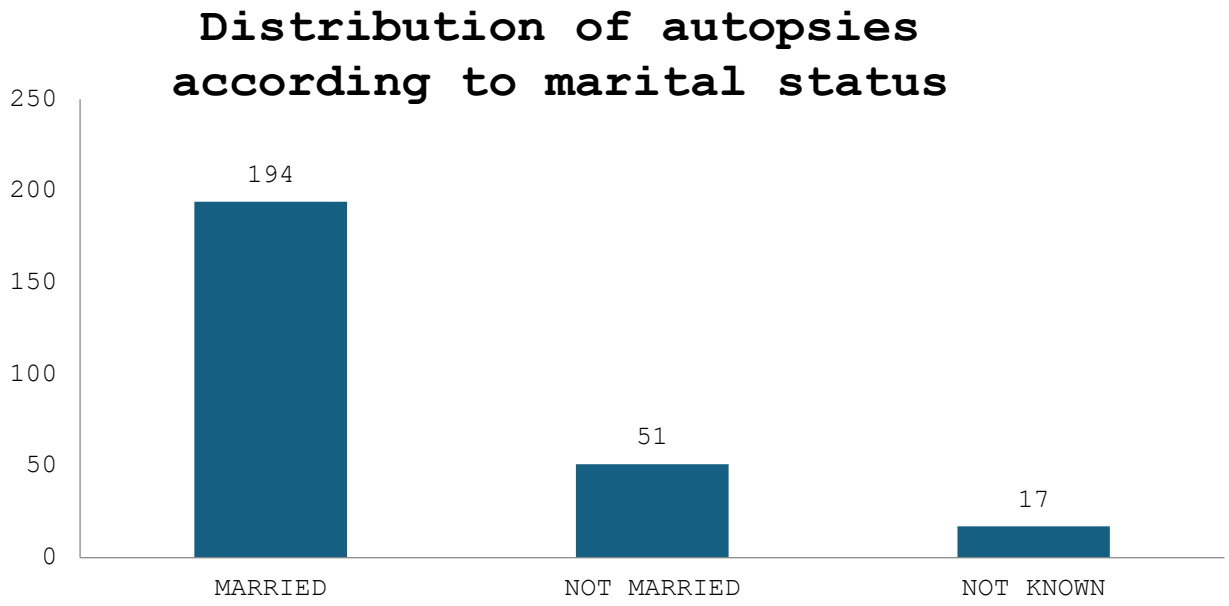
Figure 7: Bar diagram showing the distribution of autopsies performed according to ethnicity (n=262)



(Figure 7) A notable 55.3% (145) of the autopsies were executed on individuals deemed non-tribal, whereas a smaller 38.2% (100) were executed on individuals deemed tribal.

Figure 8: Bar diagram showing the distribution of autopsies performed according to marital status (n=262)



(Figure 8) A large portion of 74.0% (194) of the autopsies executed involved individuals who were in matrimony, whereas a less significant 19.5% (51) involved those not in marriage.

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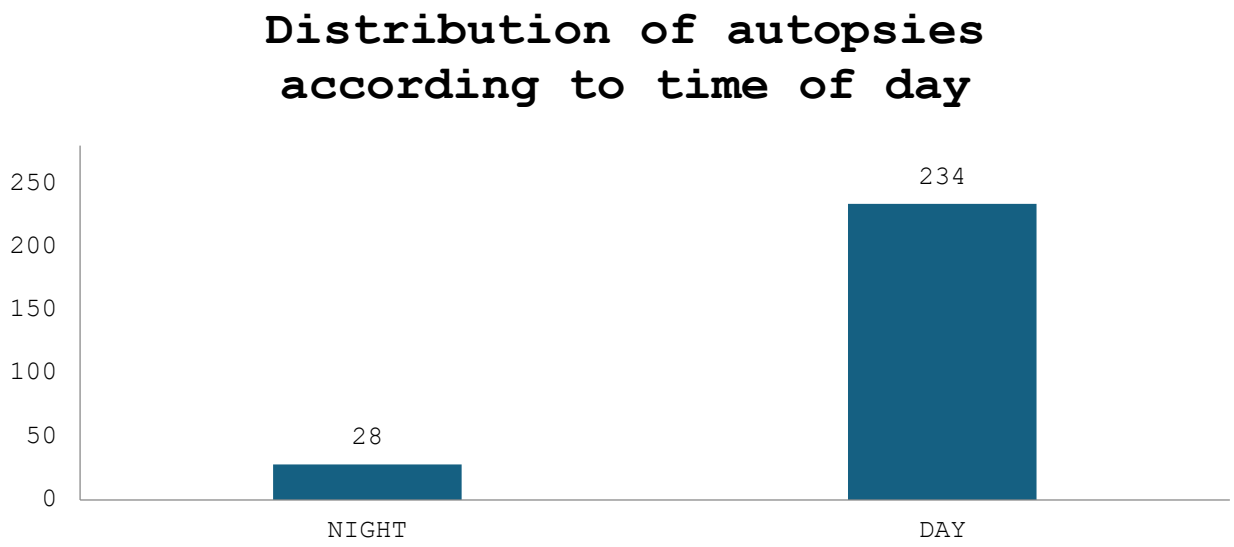
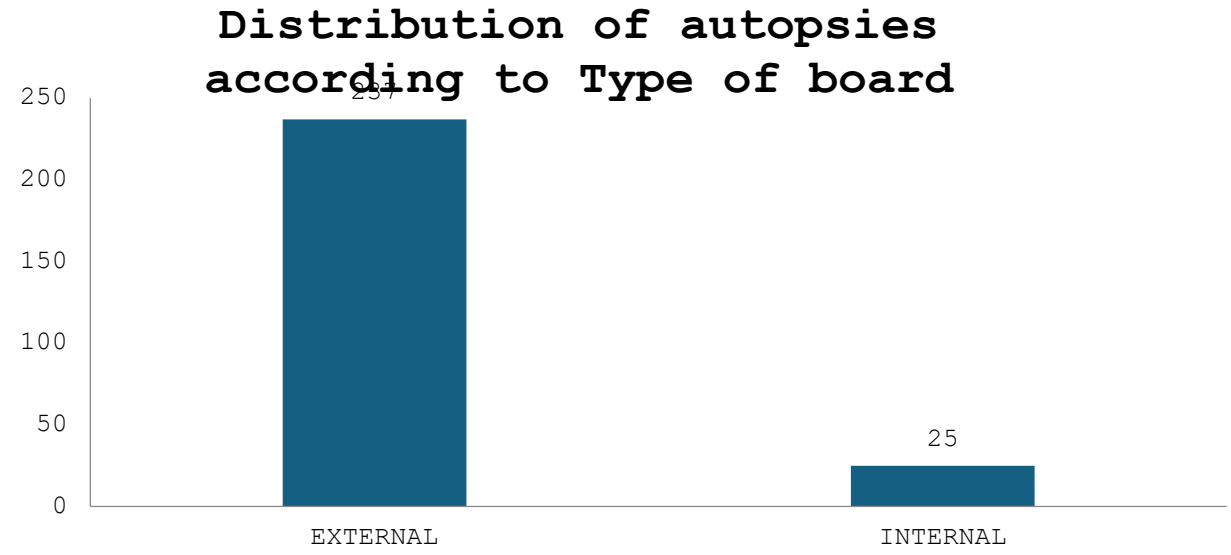
Figure 9: Bar diagram showing the distribution of autopsies performed according to time of day (n=262)



(Figure 9) The vast majority of autopsies were performed in daylight, representing 89.3% (234), in contrast to the 10.7% (28) that happened after dark. It is noteworthy that all autopsies carried out at night were mandated by the Deputy Collector of Ranchi.

Figure 10: Bar diagram showing the distribution of autopsies performed according to the type of board (n=262)



(Figure 10) A substantial majority, specifically 90.5% (237), of the autopsies were conducted under an external board comprising medical professionals from varying specialties.

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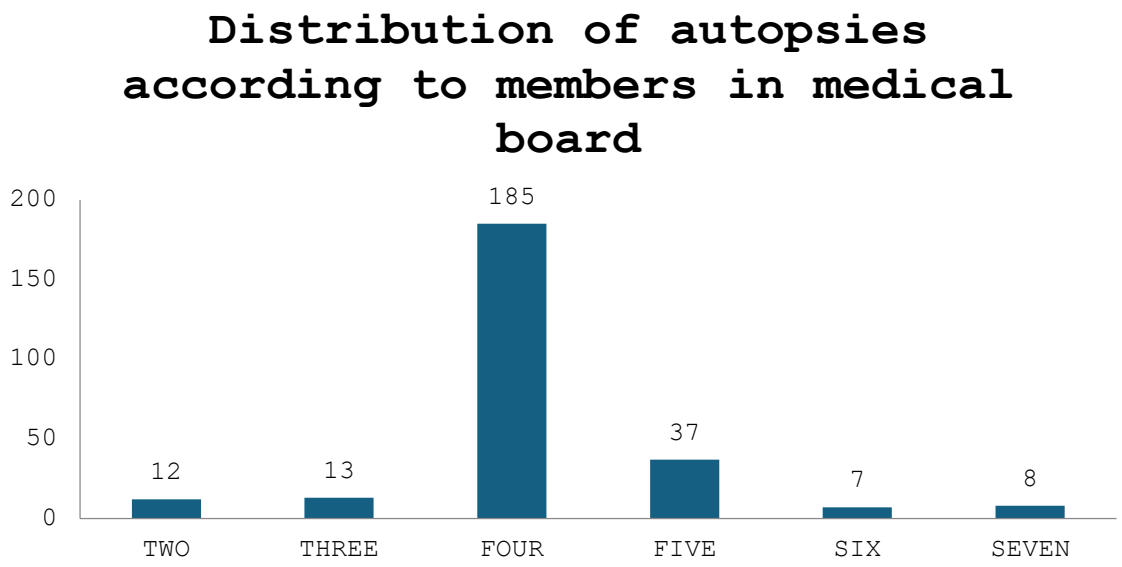
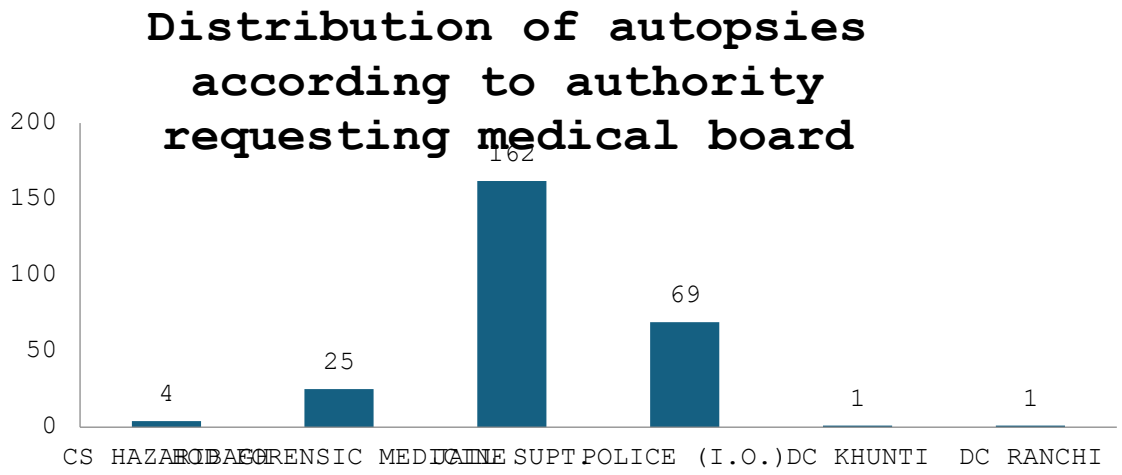
Figure 11: Bar diagram showing the distribution of autopsies according to the number of members in the medical board(n=262)



(Figure 11) Out of 262 autopsies,70.6% (185) had a four-member medical board, while 14.1% (37) had a five-member board. Only two members constituted a medical board in 4.6% (12) cases, whereas 3.1% (8) necessitated a seven-member medical board.

Figure 12: Bar diagram showing the distribution of autopsies according to authority requesting medical board(n=262)



(Figure 12) A significant majority, specifically 61.8% (162), of the autopsies conducted under the auspices of the medical board were executed after a formal request from the Jail superintendent. The second highest frequency of requests, amounting to 26.3% (69), originated from the investigating officer (police).

DISCUSSION

The current investigation was conducted within the Department of Forensic Medicine and Toxicology at RIMS, Ranchi, to characterize mortalities requiring medicolegal autopsies by a medical board executed in the department from April 2015 to March 2020. Throughout this interval, a cumulative total of 15,683 medicolegal autopsies were performed, among which 262 instances involved medicolegal autopsies conducted by medical boards.

As part of this investigation, the assessment of 262 autopsy cases uncovered that 2018 had the most notable number of cases recorded at 64 (24.4%), just behind 2019 with 61 cases (23.3%), then 2016 with 58 cases (22.1%), and capping it off with 2017, which had 42 cases

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(16%). In 2015, within the period from April 1 to December 31, a cumulative total of 30 cases, equating to 11.5%, were handled. Moreover, 7 (2.7%) autopsy evaluations happening between 01.01.2020 and 31.03.2020 necessitated the involvement of a medical board for the postmortem inquiry.

In 17 situations (6.5%), the law enforcement authorities were incapable of confirming the identities of the deceased individuals with the available resources, causing an ambiguous status. A comparable outcome was documented in a research study conducted in Chandigarh, wherein unidentified corpses constituted 4% of the cumulative total of 3165 cases[15]. Furthermore, 5.3% (14) of the 262 cases subjected to autopsy by medical boards were found to be in an advanced stage of decomposition. Analogous results, specifically regarding decomposed remains representing a minor fraction of the total autopsies, were reported in several other investigations[16] [17][18] [19].

Among the 262 cases analyzed in this investigation, the maximum number of autopsies, specifically 19.5% (51 cases), were conducted on individuals within the 21 to 30 years age group. From the entire set of cases, 212 were acknowledged as male, 47 as female, and in 3 cases, the sex was not determined as they were connected to stillborn fetuses exhibiting various congenital irregularities. Roughly 46.6% (122 cases) of the autopsies were performed on those who identified as Hindu, whereas 34.0% (89 cases) involved practitioners of Sarna, the local religion of Jharkhand. The analysis showed 22 cases (8.4%) of Muslims and 12 situations (4.6%) of Christian faith. More than fifty percent, totaling 55.3% (145 events), of the autopsies were performed on individuals marked as non-tribal, whereas 38.2% (100 events) were executed on individuals marked as tribal. Of the total autopsies, a clear majority of 74.0% (194 cases) involved married individuals, with 19.5% (51 cases) being conducted on unmarried individuals. In 17 instances, the religious affiliation and marital status remained indeterminate. Comparable findings have been documented in a variety of other studies [20] [21] [22] [23] [24] [25] [26].

The majority of autopsies, specifically 89.3% (234), were conducted during daylight hours, whereas a minority, constituting 10.7% (28), were executed nocturnally. All nocturnal autopsies were commissioned by the Deputy Collector of Ranchi, Jharkhand. The demographic of autopsies carried out at night encompassed fatalities resulting from Police-Maoist confrontations, purported incidents of medical negligence, deaths occurring within college hostels, casualties stemming from a hooch disaster, custodial fatalities within police facilities and Bal Sudhar Grih, mass acts of suicide or homicide, alleged deaths due to stampedes following mob altercations, the violent homicides of two brothers engaged in business via firearms, and an alleged case of rape and murder, characterized by the discovery of an unidentified female corpse in a partially incinerated condition.

Over two-thirds, specifically 90.5% (237), of the autopsies were conducted under external boards, where requests were made by police or judicial authorities. Conversely, 9.5% (25) of the autopsies were executed under internal boards. Across the 262 autopsies reviewed, a substantial 70.6% (185) were done by groups of four medical board members, while 14.1% (37) were completed by groups of five members. A mere 4.6% (12) of the cases involved medical boards comprising only two members, whereas 3.1% (8) cases required the assembly of a seven-member medical board. A substantial majority, specifically 61.8% (162), of the autopsies performed under medical boards were initiated following requests from Jail Superintendents. Following this, investigating officers from the police department made the next highest number of requests, accounting for 26.3% (69).

CONCLUSION

The majority of the Medical Board autopsies were carried out in the age demographic of 21 to 30 years, with a predominance of males totaling 212 (80.9%). In a small fraction, specifically 6.5%, the identification of the deceased individual remained uncertain for law enforcement agencies. Moreover, 5.3% of the 262 cases subjected to autopsy by medical boards exhibited advanced stages of decomposition. Out of all the autopsies, a notable 89.3% were performed in the light of day, leaving 10.7% to occur after dark. Furthermore, the majority (90.5%) of the autopsies were conducted under external boards, with 61.8% being executed following requests from Superintendents of various correctional facilities. Conversely, 9.5% (25) of the autopsies were undertaken under internal boards. Notably, 70.6% of the autopsies involved four-member medical boards.

Generalizability

Comparative examinations performed in alternative jurisdictions are crucial for enhanced characterization of Medical Board autopsies, which can inform the development of standardized operational procedures for their execution.

Limitations

The importance of autopsy examinations is insufficiently recognized, thereby limiting their utilization and the potential benefits they might provide for clinical practice, scholarly research, and policy development.

Recommendations

Comprehensive protocols are essential to guarantee that the performance of autopsies by Medical Boards upholds the trust and dependence of legal entities and the judiciary while concurrently avoiding the imposition of an undue strain on the constrained resources of government medical institutions.

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Data Availability
Data is available upon request.

Author contributions
All authors contributed to the design of the research. AK and SK collected and analyzed the data. KS wrote the manuscript. AK, SK, and SM edited the paper. All authors read and approved the paper.

Source of funding
No funding was received.

Conflict of interest
The authors have no conflicting interests to declare.

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