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## Characteristics of deaths in custody through forensic medicine examination

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### Abstract

A cross sectional study was conducted at National Institute of forensic medicine of Vietnam on characteristics of deaths in custody through forensic medicine examination. Out of 125 deaths in custody were autopsied by the forensic medical specialist. The majority of the male sex is 94%. The deaths accounts for the largest number of people age group 41-50 (25.6%). Pathological causes accounts for 82.4% (103 cases), in which, tuberculosis accounts for the highest rate (19.42%), cardiovascular disease (17.48%), severe pneumonia (15.53%), multi-organ dysfunction syndrome and multi disease accounted for (15.53%), cerebrovascular accident (9.71%), cancer and HIV/AIDS (5.83%), cirrhosis ascites (4.85%), encephalitis, meningitis and gastrointestinal bleeding all accounted for (2.91%). Deaths are related to violent impacts, accounting for 14.4% (22 cases), of which hanging accounts for the most, others cause as trauma, drugs shock, poisoning, electricity shock with a small rate.

**Keywords:** Deaths in custody, cause of death, forensic medicine

### Introduction

Deaths in custodies, whether during arrest, in jails or in other institutions, are among the most difficult and contentious deaths for forensic medical specialist to investigate. Several reports from countries in recent years have shown that causes of death among people in detention institutions are more closely related to causes such as suicide, diseases or related to violence<sup>[1, 2, 3, 6]</sup>. Deaths in prison or detention place always attentive the public and can sometimes be seen as a complicated case. In principle, all of these deaths must be subjected to a forensic examination. In Vietnam, the law also stipulates that all deaths in prisons must have the cause of death determined through forensic examination<sup>[4]</sup>.

We carried out the study on "Characteristics of deaths in custody through forensic medicine examination at the National institute of forensic medicine" with the objective: Describe the injury characteristics and classify the cause of deaths in custody.

### Materials and Methods

A total of 125 deaths in custody were autopsied by the forensic medical specialist of Vietnam National Institute of forensic medicine. Deaths in custody in this study include people died at prisons, detention camps, reformation and concentration-rehabilitation institutions. The study, before being conducted, was approved by the Institute's ethics committee. Basic information was collected including age, gender, external and internal injury characteristics, cause of death, manner of death, etc. Collected results were analyzed statistically.

### Results

**Table 1:** Sex distribution

Sex	n	Percentage
Male	117	94%
Female	8	6%
Total	125	100%

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Out of the total of 125 cases, the proportion of men accounted for the majority (94%), women accounted for a small proportion (6%).

**Table 2:** Age distribution

Age	n	Percentage
≤ 20	2	1.6%
21-30	28	22.4%
31-40	31	24.8%
41-50	32	25.6%
51-60	23	18.4%
> 60	9	7.2%
Total	125	100%

A total of n = 125 cases with the lowest age of 16 and the highest age of 69, the mean age was 41.16. The distribution by age group is as follows:

The deaths accounted for the largest number of people aged group 41-50 (25.6%), 31-40 (24.8%), followed by group 21-30 (22.4%), 51-60 (18.4%), the lowest group age ≤ 20 (1.6%).

**Table 3.** External injuries

Injuries	n	Percentage
With external injuries	54	43.2%
Without external injuries	71	56.8%
Total	125	100%

Deaths with external injuries accounted for 43.2%, without external injuries are 56.8%.

**Table 4:** Characteristics of external injuries

Type of injuries	n	Percentage
Abrasion, bruise	17	31.48%
Soft tissue wound	2	3.70%
Bone fracture	1	1.85%
Injection trace	8	14.81%
Ligature or strangulation marks	15	27.78%
Bullet wound	1	1.85%
Others (ulcers, skin necrosis, etc.)	10	18.52%
Total	54	100%

Out of a total of 54 deaths with external injury, cases with abrasions and bruises accounted for the highest rate of 31.48%, followed by ligature or strangulation marks (27.78%), ulcers, skin necrosis (18.52%), injection traces (14.81%), other injuries account for a small percentage, respectively: soft tissue wounds (3.7%); bone fracture (1.85%); bullet wound (1.85%).

**Table 5:** Characteristics of internal injury due to external force

Type of injuries	n	Percentage
Traumatic brain	5	27.8%
Neck trauma	3	16.7%
Chest trauma	2	11.1%
Abdominal trauma	1	5.6%
Multiples trauma	2	11.1%
Amussat's sign in carotid	5	27.8%
Total	18	100%

Among 18 cases of injury due to external force, traumatic brain injury and Amussat's sign in carotid accounted for the highest rate (27.8%), followed by neck trauma (16.7%), chest trauma and multiples trauma were both 11.1%, and

finally abdominal trauma (5.6%).

**Table 6.** Classification of non-pathological causes of death

Causes of death	n	Percentage
Hanging	15	68.18%
Trauma	4	18.20%
Shock due to drugs	1	4.54%
Poisoning	1	4.54%
Electricity shock	1	4.54%
Total	22	100%

Among the 22 deaths with non-pathological causes, hanging accounted for the largest number (68.18%), trauma (18.20%), others cause as drug shock, poisoning, electricity shock all accounted for 4.54%.

**Table 7.** Classification of pathological causes of death

Classification of diseases	n	Percentage
Cardiovascular disease	18	17.48%
Tuberculosis	20	19.42%
HIV/AIDS infestation	6	5.83%
Cerebrovascular accident	10	9.71%
Cancer	6	5.83%
Severe pneumonia	16	15.53%
Gastrointestinal bleeding	3	2.91%
Cirrhosis ascites	5	4.85%
Meningitis, encephalitis	3	2.91%
Multi-organ dysfunction syndrome, multi disease	16	15.53%
Total	103	100%

In 103 cases of disease-related death, tuberculosis accounted for the highest rate (19.42%), cardiovascular disease (17.48%), severe pneumonia (15.53%), multi-organ dysfunction syndrome and multi disease accounted for (15.53%), other causes accounted for less proportion respectively: cerebrovascular accident (9.71%); cancer and HIV/AIDS (5.83%); cirrhosis ascites (4.85%); encephalitis, meningitis and gastrointestinal bleeding all accounted for (2.91%).

**Table 8.** Manner of death

Manner of death	n	Percentage
Diseases	103	82.4%
Trauma related to violence	2	1.6%
Suicide	16	12.8%
Accident, drugs shock	4	3.2%
Total	125	100%

Mortality related to disease accounted for the highest rate (82.4%), suicide (12.8%), accident and drug (3.2%), trauma related to violence counted for at least (1.6%).

**Discussion**

▪ **Sex distribution**

The study results show that, in a total of 125 deaths, the proportion of males accounted for the majority with 94%, while females accounted for a small percentage of 6%. The results are similar to those of Cristian Gherman *et al.* [5]. In Romania, a total of 113 deaths occurred in detention institutions, with 110 cases being male, accounting for 97%, and female accounting for 3% [5]. The results of study of Wendy L. Wobeser *et al.* from 1990-1999 in custody in Ontario, Canada, there were 283/291 deaths in men accounting for 97.25%,

women accounting for 2.25% <sup>[1]</sup>. This result is also completely consistent because of the fact that the number of female offenders is much lower than the number of male offenders in Vietnam as well as in other countries around the world.

#### ▪ **Age distribution**

A total of 125 cases with the lowest age of 16 and the highest age of 69, the mean age was 41.16. This result is similar to the research results of Wendy L. Wobeser, the average age of these cases is 40.9 <sup>[1]</sup>. The data shows that the highest number of deaths were in the age group 41-50 (25.6%), 31-40 (24.8%), followed by the age group of 21-30 (22.4%), 51-60 (18.4%), lowest group  $\leq 20$  (1.6%). According to research by Cristian Gherman *et al.* the age group of 50-59 accounted for the highest rate of 28.31%, followed by the age group of 40-49 accounted for 26.54%, the age group of 30-39 was 22.12%, etc. <sup>[5]</sup>.

According to the results, we found that the age of deaths in custody in Vietnam was mainly in the youth and middle age, in the elderly (over 50) and young people (under 20) accounted for less because the number of offenders in the youth and middle age was also higher than that of the elderly or young people. However, the cause of death in these ages must also be revisited to learn more about whether mortality in each age group was related to violence, disease or other causes. The difference in studies may be due to the fact that in different countries, there are differences in race, life expectancy, living conditions and disease situation, and the type of crime in each custody are also different.

#### ▪ **Characteristics of external injuries**

The data shows that 54 out of 125 cases had external injuries, accounting for 43.2%. External injuries have relatively diverse characteristics. Out of a total of 54 deaths with external injuries, cases with abrasions and bruises accounted for the highest rate of 31.48%, followed by ligature or strangulation marks (27.78%), ulcers and skin necrosis (18.52%), injection traces (14.81%), other lesions account for a small percentage, respectively: soft wounds (3.7%), bone fracture (1.85%); bullet wound (1.85%).

External injuries include abrasions; bruises are minor injuries, mainly related to injuries caused by fights, accidents. Cases with ligature or strangulation marks on the neck are cases of death due to hanging as well as relatively high percentage. There are 18.25% cases of ulcers, skin necrosis occurring in cases of long-term disease, poor care and hygiene conditions, leading to inflammation and malnutrition. Intravenous injection traces on inguinal folds and veins have been implicated in drug use cases and, in rare cases, emergency infusions cases.

With such external injuries characteristics, it is required that forensic medical specialists have to conduct a meticulous and careful examination to detect all the lesions, which helps the assessment to be complete and comprehensive.

#### ▪ **Characteristics of internal injuries caused by external forces**

A total 18 out of 125 cases were found internal injuries

related to external forces, accounting for 14.4%. Among 18 cases of injury caused by external force, traumatic brain injury, Amussat's sign in carotid all accounted for the highest rate (27.8%), followed by neck trauma (16.7%), chest trauma and multiples trauma both 11.1%, and finally abdominal trauma (5.6%). There are 5 cases of traumatic brain injury accounting for 27.8% related to external forces such as being hit, falling, including 01 case of brain injury caused by bullets. Cases with Amussat's sign in carotid also account for a high rate (27.8%) because the rate of hanging cases is also high equivalently. This results show that the forensic medical specialist had carefully examined the lesions deep inside the neck for the cases of death by hanging and found that the Amussat's sign in carotid which are relatively specific lesions by hanging. There are 3 cases of neck injuries, which were related to high-fall accidents and fractured cervical vertebrae, accounting for 16.7%. Injuries to the chest and abdomen account for a lesser proportion, mainly injuries caused by fighting and stabbing themselves.

#### ▪ **Classification of non-pathological causes of death**

Our study shows that among the 22 non-pathological deaths, the injuries related to violence were also quite diverse. In particular, it should be noted that the rate of hanging accounts for the majority of these cases (68.18%). Hanging cases are often caused by suicide. According to Wendy L.W, the death cases due to suicide by hanging accounted for a very high rate (31.8%) <sup>[1]</sup>. Therefore, detention institutions need to pay special attention to the place of detention in order to minimize the favorable conditions for suspects or prisoners to commit suicide. Injury caused by external forces accounts for 4 cases (18.18%) due to fighting or suicide related to weapons such as knives, guns. Therefore, special attention should be paid to minimize the presence of weapons in detention institutions. Drugs shock with 1 case proved that detention units cannot guarantee 100% that no drugs are present at detention institution. There is 1 case of poisoning with the herbicide due to suicide. These are also substances that need to be kept in mind to avoid creating favorable conditions for subjects to commit suicide.

#### ▪ **Classification pathological causes of death**

The results show that there were 103 deaths related to disease out of 125 cases, accounting for 82.4%, which is quite high. Also according to Margaret Noonan *et al.*, mortality in local jails and state prisons in U.S. up to 89% of deaths were due to diseases <sup>[6]</sup>.

Among 103 deaths due to disease, the cause of tuberculosis accounted for the highest rate (19.42%). This result can also be easily understood for many reasons, including poor living conditions in detention institutions, easy infection, poor care and treatment conditions. Cardiovascular disease is the second cause of death from disease, accounting for 17.48%. This result is lower than the result of a study in the U.S. by Margaret Noonan *et al.*, cardiovascular disease accounted for 26% <sup>[8]</sup>. Cancer accounts for (5.83%), much lower than the Margaret Noonan's study: cancer (31%) <sup>[8]</sup>. Cirrhosis accounts for 4.85% while the study results of Margaret Noonan were approximately 10% <sup>[6]</sup>.

Severe pneumonia and comorbidities also accounts for a fairly high rate (both were 15.53%). It also showed that living conditions as well as medical care conditions are not well. Other diseases accounts for a lesser proportion but they are also quite diverse, such as cerebrovascular accident (9.71%), HIV/AIDS infestation (5.83%), cirrhosis ascites (4.85%), encephalitis, meningitis and gastrointestinal bleeding all accounted for (2.91%).

#### ▪ The manner of death

The results show that pathological cause of death accounted for the highest rate (82.4%), suicide accounted for the second highest rate (13%), accidents, drugs shock (3%), related to violence accounts for at least 2%. Our research results are similar to those of Ünal V. *et al.* A study of 125 deaths in detention institutions in Turkey showed that 83.2% of deaths were diseases related, 15.2% of deaths were unnatural and 1.6% was unidentified cause<sup>[3]</sup>.

The results also show that up to 13% of deaths are due to suicide in prisons. This is a rather high rate, but still lower than the results of Margret Noonan's research in U.S. prisons from 2000-2013, the rate of prisoners committing suicide accounted for 30 to 34%<sup>[8]</sup>. To compare with research by Wendy L.W, in cases of death by suicide accounted for 12%<sup>[1]</sup>.

In this study, we found 3% of deaths due to drugs shock. This rate we do not see in the results of other authors abroad. This is a matter of concern to prevent drugs from entering detention institutions with deadly consequences.

#### Conclusion

The results of the study on 125 deaths in custody show that: The deaths accounts for the largest number of people aged 41-50 (25.6%); disease-related mortality accounted for 82.4%, in which, tuberculosis accounts for the highest rate (19.42%); deaths were related to violent impacts, accounts for 14.4%, of which hanging accounted for the most.

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#### Conflict of Interest

Not available

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Not available

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