

Analysis of Definite Diagnosis Which were Causes of Death in Sudden Unexplained Death Corpses in Adults

การวิเคราะห์การวินิจฉัยสาเหตุการเสียชีวิตที่แน่ชัดในศพผู้ใหญ่ที่เสียชีวิตทันที โดยที่ไม่สามารถอธิบายสาเหตุการเสียชีวิต

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Abstract:

Sudden death in adult was defined as unexplained and unexpected death which occurred within 1 hour. Sudden unexplained death (SUD) was a problem of definite diagnosis especially cause of death. There were 297 corpses (11%) of SUD during 3 years (2005-2007) in Chiang Mai University, Thailand. The average age was 49.9 years old (range of age 20-89 years old). The average age of male, 48.6 years old was lower than female, 53.9 years old. The ratio of male to female was 3 to 1. The most common age range was 46-50 years in both sexes. Most frequency common cause of SUD was cardiovascular disease (CVS), 61%, especially coronary artery disease (CAD) or myocardial infarction (MI) 69%. The second and the third most frequency were respiratory disease 12%, especially pneumonia and central nervous system disease (CNS), 6.7%, especially cerebrovascular accident (CVA). However, undetermined cause of death was 8.4% after complete autopsy.

Keywords: Sudden death, SUD, CVS, CNS, CAD, CVA, Myocardial infarction and Undetermined cause of death

บทคัดย่อ

การเสียชีวิตทันทีในผู้ใหญ่ นั้นหมายถึงการเสียชีวิตที่ไม่เคยคาดคิดมาก่อนและโดยที่ยังไม่สามารถอธิบายสาเหตุการเสียชีวิตและเกิดเหตุการณ์ภายใน 1 ชั่วโมง การเสียชีวิตในลักษณะนี้เป็นปัญหาในด้านการวินิจฉัยหาสาเหตุการเสียชีวิตที่แน่ชัดและทำการศึกษาที่มหาวิทยาลัยเชียงใหม่ ซึ่งมีศพที่เสียชีวิตในลักษณะเช่นนี้จำนวน 297 ราย หรือ ร้อยละ 11 ของจำนวนศพที่เสียชีวิตโดยผิดธรรมชาติทั้งหมด ระหว่างปี พ.ศ. 2548-2550 เป็นเวลา 3 ปี ผลการศึกษาพบว่าศพเหล่านี้มีอยู่ในช่วงอายุ 20-89 ปี อายุเฉลี่ยรวม 49.9 ปี อายุเฉลี่ยเพศชายและเพศหญิง คือ 48.6 และ 53.9 ปี ตามลำดับ หรือคิดเป็นอัตราส่วน ชายต่อหญิง คือ 3 ต่อ 1 ช่วงอายุที่พบบ่อยที่สุดอยู่ระหว่าง 46-50 ปีทั้งสองเพศ สาเหตุการเสียชีวิตที่พบบ่อยที่สุดหลังจากมีการผ่าพิสูจน์อย่างสมบูรณ์ คือ โรคในระบบหัวใจและหลอดเลือด คิดเป็นร้อยละ 61 โดยเฉพาะโรคเส้นเลือดแดงเลี้ยงหัวใจตีบแคบ และทำให้กล้ามเนื้อหัวใจตาย ร้อยละ 69 สำหรับอันดับ 2 และ 3 ได้แก่ โรคระบบหายใจ ร้อยละ 12 โดยเฉพาะโรคปอดอักเสบติดเชื้อ และ โรคระบบประสาท ร้อยละ 6.7 โดยเฉพาะโรคเส้นเลือดสมองตีบหรือแตก อย่างไรก็ตามแม้จะทำการตรวจพิสูจน์อย่างสมบูรณ์ที่สุดแล้วยังไม่สามารถหาสาเหตุการเสียชีวิตที่แน่ชัดได้ ร้อยละ 8.4

Introduction

Sudden unexplained death is currently defined as natural, unexplained death occurring within 1 hour of the onset of the last symptoms^(1,2). There are different definitions about timing of death because the onset of last symptoms and death are not exactly definite time⁽³⁾. However, the exact timing of death was not clear. In general incidence, it was less than 40% of the case⁽⁴⁾. Most cases were occurred during sleeping. There are the same situation but they have a different name in some countries such as Sinus Arrest in REM sleep cycle in USA, Pokkuri in Japan, Bangungut in Philippines, Brugada in Europe and Lai Tai in Thailand.

Most common causes of SUD were CVD, especially CAD, myocarditis and cardiomyopathy^(1,5). It is the same as the previous study of Thailand⁽⁶⁾. The incidences of SUD accounts for 300,000 sudden death per year in USA⁽⁷⁾ which is 12% of unnatural death in Thailand⁽⁶⁾.

Risk factors of SUD are age (more than 45 years old), male sex, hereditary factors (autosomal dominant) and race⁽⁶⁾. The early sign and symptoms before deaths are non-specific,

chest pain, palpitation, dyspnea and snoring⁽⁷⁾. Moreover, allergy, heavy exercise or working and drugs are all associated factors which especially induce long QT- syndrome, alcoholic consumption and drug addicts.

According to the causes of SUD in many studies, Pneumonia, pulmonary embolism and asthmatic attack are predominated in respiratory system. Pulmonary tuberculosis is common in Thailand, especially AIDS patient. Cerebrovascular ischemia/infarction and hemorrhage are the most common causes of SUD in CNS.

Many countries, such as USA and Europe, could not identify the cause of death which determined after complete autopsy in about 5% of the cases⁽¹⁾ while Thailand had 19% of the cases. However, the limited of technology for complete autopsy is the major factor in making definite diagnosis causes of SUD. However, it might be miss diagnosis of the real causes of death.

Materials and Methods

All of SUDs cases were performed at Department of Forensic Medicine, Faculty of Medicine, Chiang Mai University during January 1st, 2005 to December 31st, 2007. The retrospective study of SUDs cases which were set up including autopsy microscopic examination and full laboratory investigation.

Inclusion criteria

1. SUD corpses were Asian which were over 20 years old.
2. All corpses were not decomposition or didn't die more than 24 hours excepted they were preserved as good as possible.
3. No poisons and drugs overdoses were revealed in all corpses.

Results

There were 297 SUD corpses or 11% of 2,710 corpses which were performed during 2005-2007 at Department of Forensic Medicine, Faculty of Medicine Chiang Mai University. SUD corpses were 12.5, 9.0 and 11% in each year. The ratio of male to female was 3 to 1.

The age ranged from 20 to 89 years old in both sexes and the average age of total, male and female was 49.9, 48.6 and 53.9 years old, respectively. There was no significant correlation

between cause of death in each year and sex (Pearson chi square $p = 0.848$ and $p = 0.917$, respectively)

The most common age range was 46-50 years in both sexes. CVS diseases were the most common cause of death in both sexes (60.9% of both sexes, 45.8% of male and 51% of female). Acute myocardial infarction was the most common disease which was the real cause of death (42% of all cases and 69% of CVS disease). Age range, 41-50 years, was the highest incidence.

The second most common causes of death was the disease of respiratory system (12%) and pneumonia was the most frequency.

The third most common causes of death was the diseases of CNS and GI- system (6.7% and 6.0%).

Discussion

The role of medicolegal doctor and police in the investigation of SUD is very important that the compositions of definite diagnosis in causes of death must be required (1) histories of relatives, witness or rescues team (2) investigation of police (3) medical histories (4) laboratory investigation (5) autopsy finding and microscopic examination.

The incidence of SUD is different in each country such as Chiang Mai, Thailand showed the incidence of 12% of all cases during 1990-1991 and 11% during 2005-2007 . The incidence of SUD was 0.43/100,000 persons per year in Spain⁽³⁾.

Cause of SUD is mostly the same in many countries. CVS diseases are the most common cause and respiratory system, CNS and GI-system disease, respectively^(8,9). And the frequency of CVS disease were 50% in Thailand, 47% in Los Angeles⁽⁶⁾, 20.6% in Jamaica and 70% in Denmark⁽⁶⁾.

Respiratory system disease were 11% in Thailand, 11% in Denmark⁽⁶⁾ and 16.8 % in Jamaica.

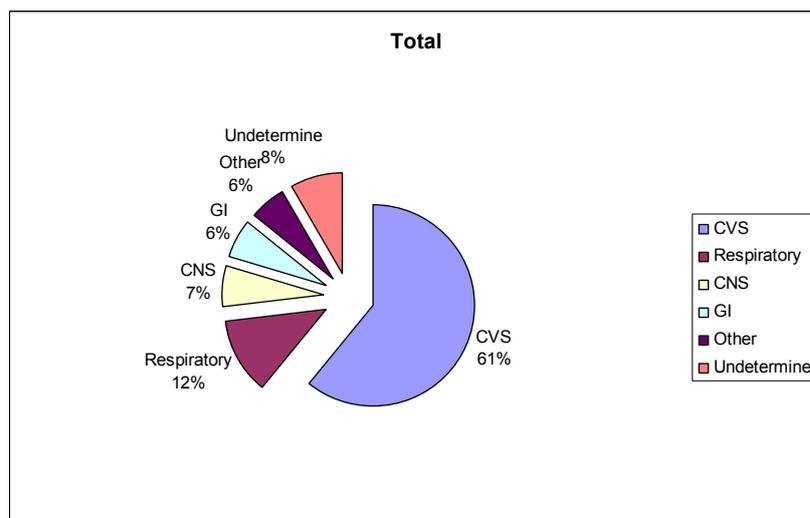
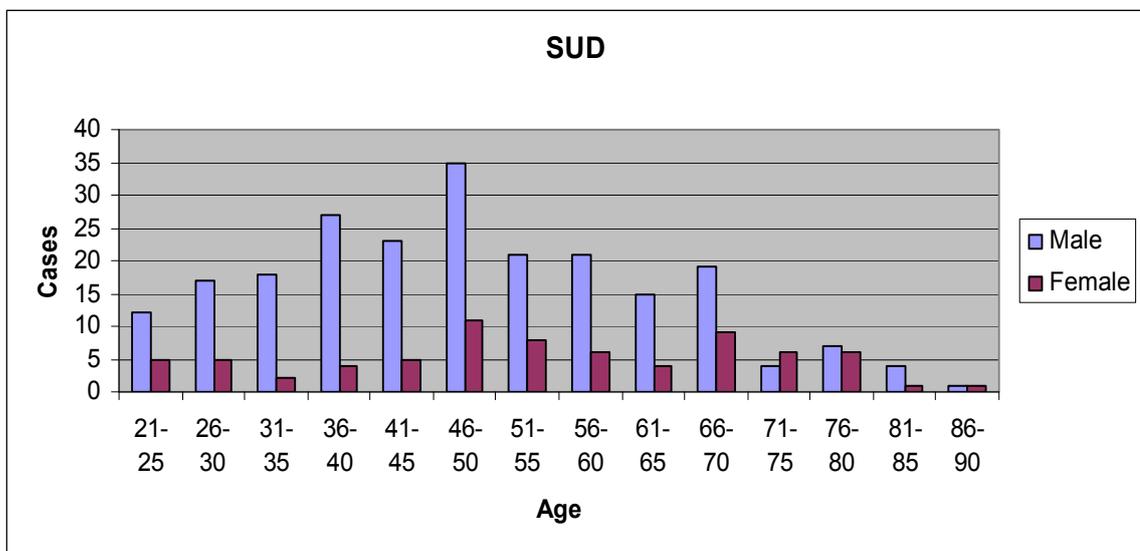
CNS disease were 6.7% in Thailand, 11% in Los Angeles⁽⁶⁾. and 11% in Denmark⁽⁶⁾.

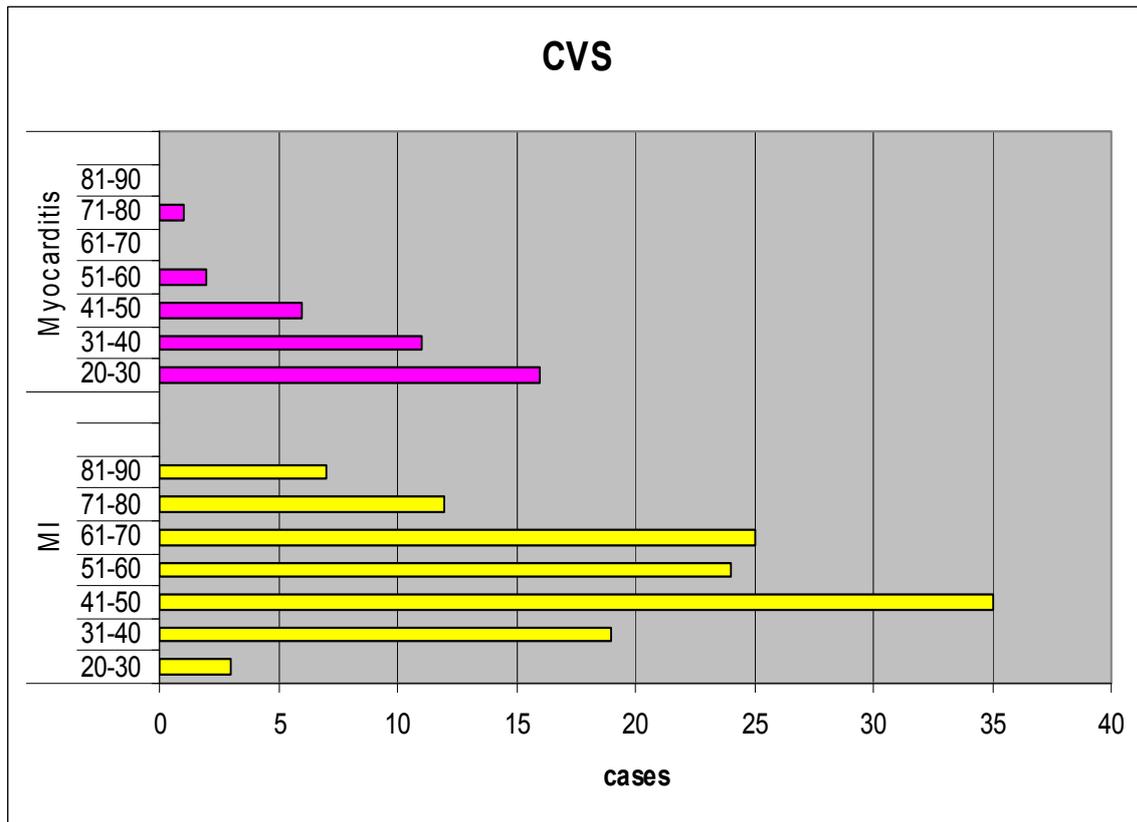
The leading disease of each system in many countries were myocardial infarction in CVS, pneumonia in respiratory system, CVA in CNS and hemorrhage in GI system.

Methamphetamine overdose was the most common cause of SUD due to poisoning in Thailand, especially young adult.

Conclusion

The defined diagnosis of SUD need history taking, scene of death investigation, the quality of autopsy, laboratory investigation and microscopic pathology respectively. Which are all depended on abilities and qualities in each country. Thailand need to improve the definite diagnosis and are mainly procedured by forensic pathologist.





List of the most frequent causes of adult sudden death.

CVS	MI (Myocardial Infarction)
	Myocarditis
	Cardiac tamponade
	Thoracic aortic rupture
	AAA (Aortic Abdominal Aneurysm)
Respiratory	Pneumonia
	CA lung
	Pulmonary embolism
CNS	ICH (Intracranial Hemorrhage)
	BSAH (Basal Subarachnoid Hemorrhage)
	Brain abscess

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