

## Medical Malpractice in Cardiovascular Surgery; Cases Referred to Tehran Forensic Medicine Organization during 2011-13

Kazemi Sh, Mostafazadeh B, Heshmati Sh, Emamhadi MA\*

Department of Forensic Medicine and Toxicology, Shahid Beheshti University of Medical Sciences, Tehran, Iran

---

### ARTICLE INFO

*Article Type:*  
Original Article

*Article History:*  
Received: 2 July 2015  
Revised: 23 July 2015  
Accepted: 27 July 2015

*Keywords:*  
Recklessness  
Negligence  
Forensic medicine  
Cardiovascular surgery  
Medical malpractice

---

### ABSTRACT

**Background:** Cardiovascular surgeries are a most common and important surgeries in Iran and because of its high risk nature, the outcome is not always satisfactory, so could lead to a complaint. In recent years, there has been an increase in complaints against cardiovascular surgeons. Aim of current study was to determine the frequency of medical malpractice in the field of cardiovascular surgery in the cases referred to the Tehran forensic medicine commission.

**Methods:** In this retrospective cross-sectional study, all malpractice cases referred to the forensic medicine commissions in Tehran with regard to the field of cardiovascular surgery during 2011-2013 were collected. Information such as age, sex, type of hospital (state or private), type of cardiosurgery, type of malpractice, percentage of malpractice, cause of death, and background diseases were extracted and then analyzed.

**Results:** Of the 56 cases, the frequency of malpractice was 27 cases (48.2 %) and the most important type of malpractice was negligence (32.2%) and the majority of cases were related to private centers. The most common malpractice was related to coronary artery disease and the main cause of complaint was the patient death (76.8%). 54.5% of malpractice rate was in men and in patients older than 60 years (67%) which was higher than other age groups. There was no significant association between age and sex with malpractice.

**Conclusion:** Despite improvement in medical technology and the use of advanced techniques in the diagnosis and treatment, the complaint rate of cardiovascular surgeons is increasing. In addition to optimizing cardiovascular surgical techniques, informing the patient and his/her companions about the side effects of these high risk surgeries can be effective in prevention of malpractice and physician mistakes.

Copyright©2015 Forensic Medicine and Toxicology Department. All rights reserved.

---

► *Implication for health policy/practice/research/medical education:* Medical Malpractice in Cardiovascular Surgery

---

► *Please cite this paper as:* Kazemi Sh, Heshmati Sh, Emamhadi M. *Medical Malpractice in Cardiovascular Surgery; Cases Referred to Tehran Forensic Medicine Organization during 2011-13. International Journal of Medical Toxicology and Forensic Medicine.* 2015; 5(4): 207-13.

---

### 1. Introduction:

Despite international attention to the issue of medical malpractice and other its effective factors, but necessary information about physician condemnation rate in different specialties, and the amount of likely damages and compensation is very rare (1, 2). However, an American Medical Association (AMA) investigation in 2011 demonstrated that 5% of interviewed physicians had medical malpractice litigation in the previous year (3). Another study in various specialties such as internal medicine, surgery, orthopedics, neurosurgery, radiology, gynecology, and obstetrics showed that the total of 48% prosecution occurred because of malpractice during three years, and only 12% of the surveyed samples announced there were no litigation and complaints against them. 93% stated that they have defended themselves, 32% of subjects avoided certain procedures due to fear of complaint, and 39% avoided treating high-risk patients due to fear of complaint (4).

Medical malpractice is generally divided into two categories; recklessness (lack of care about risks or dangers and acting without thinking about the results of your actions; and negligence (failure to use a reasonable amount of care when a failure results in an injury or damage). Inexperience in both practical (lack of technical skill which is necessary during treatment) and incomplete medical knowledge (lack of knowledge necessary to plan the best treatment), violations of law and the forgetting are some of the causes (5, 6).

Cardiovascular diseases are the most common diseases in the world. In Iran, these diseases are the major causes of mortality, and its prevalence is gradually increasing (7-9). On the other hand, with advances in medical technology, particularly in the field of surgery, now a lot of public and private

medical centers are performing high risk cardiovascular surgeries, and consequently the number of complaints in such surgeries can also be high.

Unfortunately in Iran there are no statistics about the prevalence of malpractice among cardiovascular surgeons. A study in USA indicates the malpractice rate in cardiac surgeons is 18.9% (10). Severe dependence of cardiovascular surgery to technology can increase its complexity, making its outcomes more challengeable. Given the importance of cardiovascular diseases and its high mortality rate, which is the leading cause of death in Iran, objective of the study is to obtain information about these malpractices.

### 2. Materials and Methods:

In this Routine data base study, all malpractice cases notified to the forensic medicine commissions in Tehran during 2011-2013 in the field of cardiovascular surgery were investigated. The required information such as age, sex, hospitalization (State or Private), type of cardiosurgery, type of malpractice, the percentage of malpractice, the cause of death, background diseases, and cause of complaint form physician were extracted and fill out a researcher made questionnaire.

Ethical issues were fully respected and the names of patients, staff and physicians have been completely confidential and not mentioned in questionnaire and were maintained in code. All Data were analyzed with SPSS V18. Discrete data were expressed as frequency (percentage) and continuous data were expressed as the mean and standard deviation. To compare findings in gender and age groups, chi-square test was used. Level of confidence was considered 95%.

### 3. Results:

During 2011-2013, there were 56 complaints (litigation) in the field of Cardiovascular Surgery, of which 33 patients (59%) were male. The mean age of patients was  $50.1 \pm 17.8$  years and range from 4 to 82 years (Table 1).

The most common malpractice based on background disease was coronary artery

---

*Corresponding author:* Emamhadi M, MD. Associate Professor, Department of Forensic Medicine and Toxicology, Shahid Beheshti University of Medical Sciences, Tehran, Iran  
E-mail: emamhm@sbmu.ac.ir

**Table 1:** Mean, Standard Deviation and age range based on sex distribution in the studied cases

sex	Age (years)	Mean age, y	Standard Deviation, y	age range, y
Men		51.3	16.1	4-72
Women		48.4	19.2	14-82
Total		50.1	17.9	4-82

**Table 2:** Frequency of treating centers, cause of litigation, type of malpractice and responsible of malpractice in studied cases

variables		Percentage	Frequency
Treating centers	Private	25	25
	State non-affiliated to university	30.4	17
	State affiliated to university	44.6	14
Cause of litigation	Death	76.8	43
	Infection	10.8	6
	Emboli or Hearth Attack	9	5
	Inefficiency of Pacemaker	3.6	2
Type of Malpractice	Recklessness	14.4	7
	Negligence	41.4	20
Responsible of Malpractice	Surgeon	40.2	15
	Cardiologist	18.5	7
	Supervisor	13.4	5
	Anesthesiologist	3.2	3
	Nurse	4.1	2

disease, then hypertension and diabetes. Most of the complaints were occurred in the private centers, then non-university-affiliated

state centers, and the fewest complaints were in state university-affiliated centers.

Also, based on the type of surgery, the highest rate of malpractice was related to

**Table 3:** Mean, Standard Deviation and age range of malpractice based on sex distribution in studied cases

sex	range of malpractice	Mean (%)	Standard Deviation	Age range
	Men		54.3	22.6
Women		12.1	5.2	2-25
Total		48.6	21.4	2-70

**Table 4:** Frequency of malpractice based on age in studied cases.

malpractice	Age (year)	<20 years old (%)	20-39 (%)	40-59 (%)	>60 (%)	P value
	Recklessness		1 (3.7)	2 (7.4)	2 (7.4)	3 (11.1)
Negligence		1 (3.7)	2 (7.4)	7 (90.6)	9 (33.3)	
Total		2 (7.4)	4 (14.8)	9 (100)	12 (44.4)	

**Table 5:** Frequency of malpractice based on sex in studied cases.

malpractice	Sex	Men (%)	Women (%)	P value
	Recklessness		6 (22.2)	1 (3.7)
Negligence		12 (44.4)	8 (29.6)	
Total		18 (66.6)	9 (33.3)	

coronary artery bypass graft surgery, followed by replacing and repairing the mitral valve. The least common was related to repairing the Atrial septal and pacemaker. Most complaints were deaths of patients (76.8%), then followed by wound infection (10.8%) and the lowest was inefficiency pacemaker.

The most type of malpractice was negligence. The responsibility of malpractice was most commonly related to cardiac surgeons (40.2%) and then cardiologists (18.5%), while the lowest was related to the nurses (Table 2). The malpractice ranges of 2 to 70% with an average of 48.6%, the

highest and lowest frequencies were 20% and 70%, respectively (Table 3). The proved malpractice rate in male patients was 66.6% which is more than women (33.3%), but the difference was not significant between them (Table 4). The malpractice rate at age over 60 years was 44.4% and it was higher than other age groups, although the association between age and malpractice was not significant (Table 5).

#### 4. Discussion:

The scorpionism is an actual public health certainly; medical malpractice is unavoidable, because of the potentially

serious nature of the treatment and medical interventions. But by recognizing its nature, reducing not only incidence but also rate of damage is possible. Such studies that survey the rate of medical malpractice based on different medical specialties, type of malpractice and court decision are extremely rare. In this cross-sectional study we investigated the frequency of malpractice in the cardiovascular surgery cases referred to Tehran Legal Medicine during 2011-13.

Generally the frequency of malpractice was 27 out of 56 (48.2 %) and the most important type (32.2%) of malpractice was negligence, mostly because of lack of skills. According to the referring center, the largest number was related to private centers and then governmental non-academic centers and the most common cause of complaint was the patient's death (76.7 %).

The most responsibility of malpractice was attributed to cardio-surgeons (21.4%). The frequency of malpractice by sex showed that the malpractice rate in men was 54.5% and more than women (39.1%); although the difference was not significant. Malpractice complaints were most often filed when the patient was 60 years (67%), but there was not a significant association between age and medical malpractice. Most studies that have been conducted in Iran had findings which are consistent with our study. In a study of Khavanin zadeh *et al.* the highest rate of complaints was from the private centers (11). Also in a study by Akhlaqi, the highest numbers of complaints were from private centers (40%) and most complaints were due to mortality, while the most common type of malpractice was inexperience and next was negligence (12).

In a study conducted by Rafizadeh, the most common type of malpractice of general practitioners was inexperience and 87% of complainants were men that were higher than our study (87% vs. 59% in current study). Also most litigation was from male physicians, and most malpractice was in private hospitals, while the lowest percentage of malpractice was in governmental hospitals. Also, 49% of litigation was due to the death of the patient. This study showed that the total number of

complaints from 2001 to 2003 increased tangibly (13). In a study by Sadr *et al.*, most malpractice occurred at private centers (52%) and then charities (36%) and governmental (23%) and university affiliated centers (21%). Also, 9% of the litigation following the death of the patient and the rest was due to maim or reducing efficiency (14). In a study by Hejazi, most litigations were from private centers (42%) and 52% was due to the death of the patient, and the most common type of malpractice was violation of laws (57%) and 90% of cases was related to on-time presence of on-call physician in the hospital (15).

In this study, we did not compare the frequency of malpractice in different medical specialties but a study in USA showed that most litigation were from neurosurgeons (19%), then the cardiovascular surgeons (18.6%), general surgeons (15.2%), and family physicians (5%) (10). Other study in USA demonstrated that the prevalence of malpractice among cardiovascular surgeons is significantly higher than other physicians (7.4% vs. 3.1%;  $p=0.001$ ) (16). Also Anopam showed that the average compensation paid due to medical malpractice was 275 million dollars (10). Also, in a study by Yana *et al.* about 20.5% of the 404 litigations, led to compensation, while 15% of compensation was more than 1 million dollars and the average compensation was 562 million dollars (16). In our study, given the range of 2 to 70% malpractice and the average of 48.5%, approximately 230 million dollars, only in the cardiovascular surgery have been compensated.

Anopam investigation showed that 75% and 99% of physicians at age 65 in low-risk and high-risk fields, respectively, faced with litigation because of malpractice (10). Our study demonstrates that malpractice rate increased with rising age but the association was not significant.

One limitation of current study was relatively small sample size, so the generalizability of the results is limited. Further, in this study by surveying medical malpractice only in one field, we were not able to compare the data with other

specialties. It is hoped that another comprehensive study could overcome these limitations. The study of medical malpractice should be extensively considered and investigated in Iran so we can clarify the true prevalence of medical malpractice, the financial burden, the technical causes, and possible reasons for increased incidence of these errors. Paying attention to these issues will lead to more awareness of the medical team and the patient to make them familiar with the malpractice concept. For malpractice reporting, specific written protocols should be prepared and available to the medical team. These protocols should be filled out by the medical team and this itself prevents disturbing comments from other colleagues. It is said that actually in many cases, medical complaints are triggered by the patients' companion, other physicians and lawyers. Of course it should be noted that self-reported malpractice should not be have a punitive aspect, so all of the medical team, willingly and without fear of punishment can apply to be self-reported.

### 5. Conclusion:

The study showed that despite the improvement in medical technology and utilizing advanced techniques in cardiovascular surgery, the rate of complaint and litigation of cardiac surgeons is rising. Given the high frequency of malpractice in this field, it is necessary, in addition to optimizing the techniques of cardio-surgery and improving knowledge and practical skills, that patients and companies be informed in writing about the possible and inevitable consequences and complications of such high-risk surgeries.

### Acknowledgements

The authors thank all participants that cooperated in this project; your dedication is deeply appreciated.

### References

1. Mello MM, Studdert DM, Brennan TA. The new medical malpractice crisis. *N Engl J Med*. 2003;348:2281-4. Erratum, *N Engl J Med* 2003;349:1010

2. Benson JS, Coogan CL. Urological malpractice: analysis of indemnity and claim data from 1985 to 2007. *J Urol*. 2010;184:1086-90.
3. Kane C. Policy research perspectives — medical liability claim frequency: a 2007-2008 snapshot of physicians. Chicago: American Medical Association; 2010. pp. 1-7.
4. Birbeck GL, Gifford DR, Song J, et al. Do malpractice concerns, payment mechanisms, and attitudes influence test-ordering decisions? *Neurology* 2004;62:119-21.
5. Ghashghaei F, Prevention of medical malpractice, 1th ed. Isfahan: Entesharat e FarhangMardom. 1380:137-43. (In Persian)
6. Gorney M, Gram A. Essential of malpractice claims prevention for the surgeons; 1999:7-16.
7. Hill AG, Groom RC, Bechara F et al. pediatric perfusion survey II: Expanded multivariate data analysis; proceeding of the American academy of cardiovascular. *Perfusion*. 1991;19:96
8. Jalilvand M, Nikmanesh Z, Kazemi T, Emamhadi MA. Smokeless tobacco use among university students: A cross-sectional study in Iran, Sistan Baloochestan province, 2008. *Iran J Psych Behav Sci*. 2010;4(1):23-9.
9. Link N, Tonner M. Coronary Artery Disease: Epidemiology and diagnosis. *West j Med*. 2001;174:257-6.
10. Anupam B, Jena, Seth Seabury, Darius Lakdawalla, Amitabh Chandra, Malpractice Risk According to Physician Specialty. *N Engl J Med*. 2011;365(7):629-36.
11. Khaninzadeh M, Gholipour F. Evaluation of laparoscopy malpractice in patients with medicine commission records from 2002-2006. *forensic medicine journal of Islamic republic of Iran*. 2013;31(spring):40-44.
12. Akhlaghi M, TofighiZavareh H, Samadi F. Evaluation of Gynecology& malpractice malpractice in patients with forensic medicine commission records from 2001-2002. *forensic medicine journal of Islamic republic of Iran*. 2004;10(summer):70-4.
13. Rafiezadeh M, Hajmanuchehry R, Nassaji-Zavareh M. Evaluation of general practitioner malpractice in patients with forensic medicine commission records from 2003-2005. *Forensic medicine journal of Islamic republic of Iran*. 2007;13(3):152-7.
14. Sadr S, GhadyaniMH, Bagherzadeh AA. Evaluation of orthopedics malpractice records from 1998-2003. *Forensic medicine journal of Islamic republic of Iran*. 2007;13(2):79-86.

15. Hejazi S, Zeinali M, FarrokhSlamlu H. Evaluation of pediatrics malpractice in records referring to Urumieh Forensic medicine organization. From 1996-2006. Forensic medicine journal of Urumieh. 2009;20(2):123-30.

16. Jena AB, Chandra A, Seabury SA. Malpractice risk among US pediatricians. Pediatrics. 2013;131(6):1148-54.

17. Reich JH, Maldonado J. Empirical findings on legal difficulties among practicing psychiatrists. Ann Clin Psychiatry. 2011;23(4):297-307.