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Medical Causes of Death's Profile Based on ICD-10 Standards in Confirmed Covid-19 Patients in Tertiary Hospital in Padang, Indonesia

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ABSTRACT

Medical causes of death written by a doctor are important to be documented for each death, especially in relation to public health, research, surveys, epidemiology, prevention programs, public safety, medicine, and health administration. This is a retrospective descriptive study that aims to describe the causes of medical death in confirmed Covid-19 deaths, as well as compare the writing of causes of medical death based on the WHO International Classification of Disease (ICD) 10 standard. From this study, it is known that more than half of the information on the medical cause of death form written by doctors still does not comply with the WHO ICD-10 standard. The most common medical causes of death that have a direct impact on the death of confirmed Covid-19 patients was acute respiratory distress syndrome. Writing the cause of death according to the WHO ICD 10 standard is very necessary in obtaining accurate information on deaths related to COVID-19.

KEYWORDS: Covid-19, ICD-10 standard, medical cause of death

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INTRODUCTION

A good health report can be obtained through filling out the correct and complete medical record file. One of the most important information from medical records is the diagnosis of the cause of death.[1,2]

Medical causes of death need to be included in each patient's medical record who died, especially for the benefit of public health, epidemiology, research, public safety, medicine, and health administration. In the health sector, medical causes of death can be used to calculate life expectancy, death rates by cause and age, as a material for consideration for making decisions related to prevention efforts, so that health status will be better.[2-4.5]

WHO has determined that the International Classification of Diseases (ICD)-10 is the standard international classification system of diseases? It has been determined by the Decree of the Minister of Health of the Republic of Indonesia, No. 50/MENKES/SK/I/1998, that hospitals and health centers are required to carry out disease coding as a medical record data collection.6-8 The WHO ICD-10 standard recommends writing the causes of medical death in two parts. Part I (part I) is used for diseases related to the sequence from direct occurrence to death. Part II (part II) is used for conditions not related to the part I, but naturally contributing to death.4

Coronavirus disease 19 (Covid-19) is a viral infection that is highly contagious and endemic in the world caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). 9 The limited information on autopsy results on Covid-19 corpses has forced forensic experts to increase vigilance in investigating deaths. Information on the medical cause of death for confirmed Covid-19 patients is needed to improve the handling of Covid-19 patients.10

This study aims to determine the medical cause of death in confirmed Covid-19 patients, as well as to determine the completeness and suitability of filling in the medical cause of death in the medical records of confirmed Covid-19 patients at Tertiary Hospital in Padang, Indonesia, based on the WHO ICD-10's standard.

METHODS

This was a descriptive retrospective study that uses secondary data from all medical records of confirmed Covid-19 patients who died at Dr. M. Djamil General Hospital from April 1st, 2020 – March 31, 2021.

This research has received ethical approval from Health Research Ethics Committee RSUP Dr. M. Djamil Padang No. 186/KEPK/2021. After collecting secondary data related to medical cause of death's description, then each medical

record will be assessed for the completeness of writing the medical cause of death and compared with the WHO standard (ICD-10). The collection and analysis of data was carried out using Microsoft Excel. Data analysis was done by quantitative descriptive.

RESULT

During the research period, 159 medical records of confirmed Covid-19 patients who died at Dr. M. Djamil General Hospital. From these medical records, the information from the sheet related to medical cause of death was then collected and analyzed.

Table 1. Description of the medical cause of death in confirmed Covid-19 patients from the medical record.

No	Medical Cause of Death	Total	Percentage
Part I			
1	Acute Respiratory Distress Syndrome (ARDS)	8	34%
2	Sepsis	3	13%
3	Community Acquired Pneumonia	3	13%
4	Hospitalized Acquired Pneumonia	1	4%
5	Hypovolemic shock	1	4%
6	Acute Bleeding	1	4%
7	Multi-organ Dysfunction Syndrome (MODS)	1	4%
8	Haematemesis ec stress ulcer	1	4%
9	Hypercoagulopathy	1	4%
10	Diabetic Ketoacidosis	1	4%
11	Uncontrolled Tipe 2 Diabetes mellitus	1	4%
12	Hypertension	1	4%
13	Liver Function Disorder	1	4%
Part II			
1	Acute Respiratory Distress Syndrome (ARDS)	1	4.5%
2	Type II Diabetes Mellitus	2	9.2%
3	Hyponatremia	1	4.5%
4	Hypernatremia	1	4.5%
5	Hypokalemia	1	4.5%
6	Hypertension	2	9.2%
7	Subarachnoid Hemorrhage	1	4.5%
8	Community Acquired Pneumonia	2	9.2%
9	Pulmonary Tuberculosis	2	9.2%
10	Melena ec Peptic Ulcer	1	4.5%
11	Sepsis	1	4.5%
12	Decreased consciousness ec hipoxia	1	4.5%
13	Liver Function Disorder	1	4.5%
14	Community Acquired Pneumonia	1	4.5%
15	Acute kidney injury	1	4.5%
16	Hypertensive heart disease	1	4.5%
17	Hemorragic Stroke	1	4.5%
18	Obesity	1	4.5%

Physician's consistency in filling out medical cause of death forms

The results of data analysis showed that from the medical records of patients who died confirmed Covid-19 at Dr. M.Djamil General Hospital, the medical cause of death's form were filled out by doctors only 17 medical records (10.7%) of , while most of the form are left blank (142 medical records or 89,3%).

From the 17 medical records of confirmed Covid-19 patients that contain information about the medical cause of

death, it can be concluded that the most common cause of death that has a direct impact on patient death (part I) is acute respiratory distress syndrome (ARDS) in 34% of cases, followed by sepsis 13% and community-acquired pneumonia 13%. Meanwhile, other body conditions/dysfunctions that contributed to most deaths (part II) were type II diabetes mellitus, hypertension, community-acquired pneumonia, and pulmonary tuberculosis with each of 9.2%. The medical cause of death in confirmed Covid-19 patients at Dr. M.Djamil General Hospital is described in table 1.

The accuracy of writing the cause of death sheet based on WHO ICD-10 standards

From all medical records of confirmed Covid-19 patients at Dr. M. Djamil General Hospital which have information about the medical cause of death, then an assessment is carried out according to WHO guidelines related to the procedure for writing the medical cause of death based on the ICD-10 standard. According to table 2, it can be seen that more than half of the information on the medical cause of death form written by a physician in this hospital were still not under the WHO ICD-10 standard.

Table 2. The accuracy of writing the cause of death sheet based on the WHO ICD-10 standard in the medical records of confirmed Covid-19 patients at Dr. M.Djamil General Hospital

No.	Filling out the Cause of Death Sheet in the Medical Record by the Physicians	Total	Percentage
1.	Cause of death according ICD-10 standard	8	47,1%
2.	Cause of death that does not comply with ICD-10 standard	9	52.9%
Total		17	100%

Some of the errors in writing the medical cause of death in the medical records of confirmed Covid-19 patients were found in this study. Table 3 shows the physician's inaccuracy in writing down the cause of death in the medical records of Covid-19 patients.

Table 3. Physician's inaccuracy in writing down the cause of death in the medical records of Covid-19 patients.

No	Inaccuracy in Medical Records	Total	Percentage
1	Only wrote "Covid-19" without any other information	2	22%
2	Writing abnormalities in part I that do not describe a series of diseases	2	22%
3	Writing the patient's terminal condition: respiratory failure	4	45%
4	Cause of death in Part I and Part II that were related (a series)	1	11%
	Total	9	100%

DISCUSSION

The data of this study showed that most of the medical causes of death forms in the medical records of patients who died were confirmed to be Covid-19 at Dr. M.Djamil General Hospital were not filled in by physicians. The absence of data about the medical cause of death will have an impact on the completeness and accuracy of the epidemiological data produced regarding confirmed Covid-19 dead patients.

The most common causes of death in COVID-19 patients in this study were acute respiratory distress syndrome (ARDS), followed by sepsis and community-acquired pneumonia. Other contributing diseases were type II diabetes mellitus, hypertension, community-acquired pneumonia, and pulmonary tuberculosis with each 9.2%. This proves the statement that people with existing chronic conditions or compromised immune systems due to disability are at higher risk of death due to COVID-19.[11] This is also following Zhang's study in China which stated that more than half of Covid-19 patients who died had comorbidities, especially hypertension, heart disease, and diabetes mellitus, with immediate causes of death being a respiratory failure, sepsis, and heart failure.[12] Other studies showed that pneumonia, septic shock, and multi-organ failure were the most common immediate causes of death in hospitalized COVID-19 patients.[13,14]

Based on the data on the cause of death listed in the medical record, some writings do not comply with the ICD-10 standard. First, physicians only write down Covid-19 as the cause of death without any other information. The single writing of Covid-19 in part I has an impact on the uncertainty of the patient's final condition caused by Covid-19 and causes the patient to die.[11] Qaddumi et al study in Palestine stated

that most doctors do not understand how to write down the correct cause of death. some doctors only write down the mechanism of death without mentioning the underlying cause of death.[15]

Second, the physician writing wrote unrelated information on Ia-Ib-Ic-Id parts. On the other hand, there was information in part I and part II which are related to each other. Based on the WHO ICD-10 standard, writing the cause of death in part Ia-Ib-Ic-Id must describe a series of events (diseases) starting from Id to Ia which ultimately causes death. Part II is a disorder (disorder) in patients that contributes to the cause of death but is not a series of events listed in part I. When the disorders listed in part II are still a series of disease courses in part I, then the disorder should be included in the part I group.[3]

Third, physicians still wrote terminology from terminal events of each patient who will die but does not provide information that leads to the cause of death of the patient. Nonspecific processes and terminal events such as cardiac or respiratory arrest, asystole, ventricular fibrillation, and electromechanical dissociation do not provide useful information and should not be included in cause of death statements.[3]

CONCLUSION

Based on this study, it can be concluded that cause of death information in medical records can help can give information about abnormalities, conditions, or comorbidities that are at risk of causing death. The epidemiological information obtained will be very necessary for making policies related to preventive and curative aspects in handling confirmed Covid-19 patients. Periodic socialization is very necessary to the physicians in charge of services regarding the procedure for filling out the cause of medical death sheet according to the WHO ICD-10 standard.

LIMITATION

The limitations of this study are related to the lack of data on the cause of death in medical records, so it cannot cover all deaths due to COVID-19.

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