Accuracy of Verbal Autopsy for Assessment of Death Related to Covid-19

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ABSTRACT	ARTICLE DETAILS
During the pandemic, the management of corpses for Covid-19 was carried out according to the protocol by WHO. In practice, there are several difficulties in the field, one of which is if there is a sudden death where the death is not in a health facility, tools are needed to assess whether the death is related to Covid-19. This is important because to decide whether the bodies is treated like Covid-19 or not. The Ministry of Health of the Republic of Indonesia has made verbal autopsies of deaths that should be suspected of being related to Covid-19. This study aims to evaluate the performance of this verbal autopsy of against diagnosis in medical record. As many as 97 families of patients who died from the inpatient room were interviewed using a verbal autopsy, then the doctor concluded whether the death was related to Covid-19 or not without previously knowing the patient's diagnosis. After that, the patient's medical record is seen to find a diagnosis during treatment. Then the results were compared with the conclusions using a verbal autopsy. In this study, the autopsy verbal sensitivity was 88.09%, the specificity was 88.09% and the area under the curve was 76%, which means that the autopsy's verbal ability in diagnosing Covid-19 related deaths is considered good.	

INTRODUCTION

Coronavirus Disease-19 (Covid-19) has been declared a pandemic by WHO and causes death in more than 150 countries.[1] Indonesia is one of the countries with high cases of Covid-19 which is spread across 34 provinces. The National Disaster Management Agency has designated Covid-19 as a non-natural disaster in the form of a disease outbreak in Indonesia.[2]

The pandemic conditions resulted many died and cannot be determined with certainty whether death due to Covid-19. This matter need management of corpses according to Covid-19 guidelines for preventing the spread for medical personnel corpse recovery personnel, as well family and community. For bodies that died not in health facilities, an interview with the family is required to screen whether the death is related to Covid-19.[3-5]

Verbal Autopsy (VA) is a technique for determining the most medically likely causes of death in the community, where no physician is available to complete a medical certificate of cause of death. Briefly, VA uses a structured questionnaire to elicit the signs and symptoms exhibited by the deceased in the period before death and that can reliably be understood by and reported on by family members and other lay caregivers.[6] According to the guidelines issued by the Ministry of Health of the Republic of Indonesia regarding guidelines for burial of bodies due to Covid-19 in the community, there is verbal autopsy guide to screen deaths whether related to Covid-19 or not. [7]

Verbal autopsy of deaths that should be suspected of being related to Covid-19 made by the Ministry of Health of the Republic of Indonesia consists of :

1. Identity of interviewee, date and time of interview
2. Identity of the body: name, age, occupation, education, religion, marital status, partner's age, partner's occupation, spouse's education, address, insurance ownership, distance from home to health facility, how long it takes to reach home to health facility
3. Verbal autopsy:
a. Death information: date of death, time of death, place of death, death verified by
b. Information on the health problems of the deceased: Were there any health problems before he died? Was there a fever? Was there a cough? Was there a runny nose? Was there a sore throat? Was tehere a short of

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breath? History of traveling abroad or to infected cities in Indonesia within 14 days before symptoms appear? History of traveling to health facilities that are referred for Covid-19 treatment within the 14 days before symptoms appear? Close contact with positive cases? To overcome the disorder is there any treatment or examination?

c. History of complications: history of hypertension, diabetes mellitus, tuberculosis, chronic lung disease, heart failure, kidney disease, HIV AIDS, pregnancy/delivery/postpartum, etc

4. Family members who had close contact with the deceased

5. Non-medical constraints: personal, family, community, logistics system, administration

6. Conclusion

7. Identity of the health worker who performed the verbal autopsy

This study aims to evaluate the performance of verbal autopsy of deaths that should be suspected of being related to Covid-19 made by the Ministry of Health of the Republic of Indonesia against diagnosis in medical record. To our knowledge, no study with this purpose has been carried out yet.

METHODS

This was descriptive observational study with cross-sectional design, to see the accuracy autopsy verbal compared to the patient's diagnosis while being treated in the medical record (as a gold standard). As many as 97 patient families were interviewed according to the verbal autopsy (autopsy verbal from guidelines of the Ministry of Health of the Republic of Indonesia), then the patient's medical record data is seen to find out if there is a diagnosis of Covid-19.

The data were analyzed using a diagnostic test to find validity which consisted of sensitivity, specificity and accuracy of the autopsy verbal with the diagnosis in the medical record. Positive likelihood ratio (LR+) and negative likelihood ratio (LR-) values were also obtained. Assessment of autopsy verbal ability was carried out using the area under the curve (AUC).

RESULTS AND DISCUSSION

Diagnostic study has been carried out to assess the autopsy verbal made by the Ministry of Health of the Republic of Indonesia. All sample were interviewed using the verbal autopsy form. It was concluded that there were 51 patients with Covid-19 and 46 patients not Covid-19. Then the medical record data of the 97 patients were seen. It was found that 42 people were diagnosed with Covid-19, 55 people were not diagnosed with Covid-19.

Table 1. Comparison of the number of Covid-19 patients or not between using verbal autopsy and data in medical records

		Diagnose in Medical Record		
		+	-	
Verbal Autopsy	+	37	14	51
	-	5	41	46
		42	55	97

From the data, the sensitivity of the autopsy verbal compared to the diagnosis data in the medical record was 88,09%, spesifisitas 88,09%, positive predictive value 72,5% dan negative predictive value 91,1 %

From the results of the study, it was found that the sensitivity was quite high, 88.09%. The sensitivity of 88.09% shows the ability of the autopsy verbal test in diagnosing Covid-19 of 88.09%. While the specificity of the verbal autopsy test in

determining someone is not infected with Covid-19 is 88.09%,

The positive predictive value shows that the probability of someone being diagnosed with Covid-19 by a verbal autopsy test is 72.5%. The negative predictive value is the 91.1% chance that a person will not be diagnosed with COVID-19 based on a verbal autopsy test.
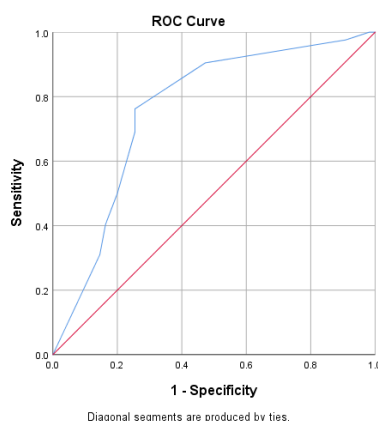

Diagonal segments are produced by ties.

Figure 1. ROC curve verbal autopsy

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Area Under the Curve

Test Result Variable(s): skor

Area	Std. Error[a]	Asymptotic Sig.[b]	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
.760	.050	.000	.662	.858

Assessment of autopsy verbal ability was evaluated using the area under the curve (AUC). The autopsy's verbal ability in diagnosing death related to Covid-19 is considered good with an AUC area of 0.76 (76 %) or ≥ 70%.

Verbal autopsy, Inter VA Rapid Mortality Surveillance (CRMS) from WHO has almost the same questions as the verbal autopsy used in this study. The questions in CMR consist of : during the 2 weeks before death did the body live in an area that required physical distancing? Did you have an injury or accident that resulted in death? Do you have a high fever? Have you ever been tested for Covid-19? Are there any fatigue complaints? Are there any complaints of coughing? Does anyone complain of loss of smell? Is there any difficulty breathing? Do you live with people who are caring for Covid-19 patients? And is there a history of traveling to areas where there is Covid-19? [8]

Study using verbal autopsy InterVA-5 by Siregar Kemal et al for deaths in communities in Indonesia during a pandemic found that verbal autopsy using a community-based mechanism was feasible to run during the COVID-19 pandemic. The mobile-based verbal autopsy application can also be used to identify causes of death at the population level. The availability of data related to suspected causes of death at the population level can hopefully serve as the basis for health program holders in making policies and plans to improve public health.[9]

CONCLUSIONS

Autopsy's verbal ability in diagnosing death related to Covid-19 has good sensitivity and specificity. This verbal autopsy can be used in daily practice for sudden death or deaths that occurred not in health facilities to determine whether the death is related to Covid-19.

FUNDING

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