The correlation between sex, age, nutritional status and diabetes mellitus with clinical symptoms mdr pulmonary tb at RSUD dr Soetomo

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Abstract. Multi-drug resistance is a condition where drugs rifampicin and isoniazid is not effective in killing bacteria Mycobacterium tuberculosis. Some of the causes of resistance to OAT are the use of a single drug in the treatment of tuberculosis, the use of drugs is inadequate and the irregular drug administration. In RSUD Dr. Soetomo, 25% of MDR Pulmonary TB patients do not want to be treated because symptoms are mild, no pain and feel the treatment is not comparable with the symptoms. This research is to determine the correlation between sex, age, nutritional status and diabetes mellitus with the clinical description of MDR pulmonary TB patients in RSUD Dr. Soetomo. Hence, it is expected people can make the earliest possible prevention against this disease. In addition, clinicians are more aware of the symptoms of MDR Pulmonary TB. Method in this research is descriptive observational study research. There were 103 patients taken as the sample of the study. Research variables consist of sex, age, nutritional status, and diabetes mellitus. The obtained data were analyzed by administering Chi-square analysis. The results of this study showed that each variable tested in this study (sex, age, nutritional status and diabetes mellitus) associated with the symptoms of MDR Pulmonary TB has p > 0.05 which means no significant relationship. There are no relation between sex, age, nutrition status and comorbidities with symptom of MDR pulmonary TB.

Keywords: multidrug resistance, sex, age, nutritional status, diabetes mellitus

Introduction
Pulmonary tuberculosis (pulmonary TB) is a disease that attacks the lungs caused by Mycobacterium tuberculosis. The prevalence of pulmonary tuberculosis in Indonesia is the third after India and China, almost 700 thousand cases, the mortality rate is still 27/100 thousand inhabitants.1

The high rate of pulmonary TB disease is caused by the easy transmission of this disease. Pulmonary TB is transmitted through air contaminated with Mycobacterium tuberculosis which is released when patients cough. Treatment of pulmonary TB should be noted, in order not to increase the number of infected patients. Multi drug resistance (MDR) is a condition in which rifampicin and isoniazid drugs are not effective in killing Mycobacterium tuberculosis germs. According to WHO, the number of MDR pulmonary TB cases in Indonesia is the eighth of 27 countries.2

The clinical management of MDR pulmonary tuberculosis is more complicated than drug-sensitive TB because it uses second-line anti-TB drugs, causing tolerance and side-effects.3 Symptoms of MDR pulmonary TB with symptoms of drug-sensitive pulmonary TB are generally the same, such as cough with phlegm for 2-3 weeks or more. Cough may be accompanied by additional symptoms of sputum mixed with blood, shortness of breath, body weakness, decreased appetite, decreased weight, malaise, night sweats without physical activity, fever over one month.4

Although the symptoms are similar, the treatment of MDR pulmonary TB and pulmonary sensitive drug TB is different. Patients with MDR pulmonary TB should take more drugs than drug-sensitive pulmonary TB for long periods of time. In fact, in
Dr. Soetomo, 25% of patients with MDR lung TB will not be treated because of mild symptoms, do not feel pain and feel unequal to treatment. Therefore, it is necessary to do research on the factors that affect the clinical symptom of patients with MDR pulmonary TB in Dr. Soetomo.

Methods
This study used cross-sectional observational research design with the sample size is the total sample, that is all patients of MDR pulmonary tuberculosis treated in RSUD Dr. Soetomo Surabaya for 1 year (January 2015 until December 2015). The samples of the study are MDR pulmonary TB patients who were treated at Dr. Soetomo Surabaya Hospital in period January 1, 2015 - December 31, 2015 whose medical records are found and complete. The research variables were gender, age, nutritional status and diabetes mellitus. The research instrument used is medical record data of patients with MDR pulmonary TB in RSUD Dr. Soetomo for a year starting from January 1, 2015 to December 31, 2015. This research was conducted in TB pulmonary MDR RSUD Dr. Soetomo Surabaya. The data collected in this research is secondary data. Data taken from medical records of patients with MDR pulmonary tuberculosis who have treatment in MDR pulmonary tuberculosis Dr. Soetomo hospital Surabaya in period January 1, 2015 - December 31, 2015. The data were analyzed through Chi-square statistic test, which examined the relationship of sex, age, nutritional status and diabetes mellitus with clinical symptoms of MDR pulmonary TB patients including fever, hemoptysis, night sweats, chest pain, and decreased appetite.

Result
After collecting the data, it was found out that there were 1,293 lung tuberculosis patients who were declared had positive MDR in East Java. Among them, there were only 142 patients who were willing to be treated in Dr. Soetomo Hospital, Surabaya. However, from the data, it was revealed that there were 103 patients, in which 54 patients were outpatients and 49 patients were unknown developmental treatment. This study used total sampling techniques. It means that all data used in this research. Data collected in this study include sex, age, weight, height, and comorbidities.

Based on sex, the most patients are men (58.3%), while female patients (41.7%). The complete distribution can be seen in the table below (Table 1).

| Sex      | Total | Percentage (%) |
|----------|-------|----------------|
| Male     | 60    | 58.3           |
| Female   | 43    | 41.7           |
| Total    | 103   | 100            |

Source: Dr. Soetomo Hospital Surabaya 2015

Characteristics of MDR pulmonary TB patients by age are divided into 3 groups: non-productive (<14 years), productive (15-64 years), post-productive (> 64 years).

The most patient age is on the productive age group (89.3%). The fewest patients were in the nonproductive age group (3.9%).

| Age                  | Total | Percentage (%) |
|----------------------|-------|----------------|
| Non productive (<14 years) | 4     | 3.9            |
| Productive (15-64 years) | 92    | 89.3           |
| Post productive (> 64 years) | 7     | 6.8            |
| Total                | 103   | 100            |

Source: Dr. Soetomo Hospital Surabaya 2015

Characteristics of patients with MDR pulmonary TB based on nutritional status calculated by the BMI formula, grouped into 3 i.e malnutrition (<17,0-18,4), normal nutrition (18,5-25,0) and more nutrients (25,1- 27,0). Status nutrition of patients with maxillary MDR lung is less nutritional status with BMI <17,0-18,4 (51,5%), whereas the least patient is patient more nutritional status with BMI 25,1-27,0 (5,8%).

| Nutritional Status | Total | Percentage (%) |
|--------------------|-------|----------------|
| Malnutrition (<17,0-18,4) | 53    | 51.5           |
| Normal (18,5-25,0)   | 44    | 42.7           |
| Obesity (25,1-27,0)  | 6     | 5.8            |

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ased on comorbidities, patients with comorbidities were most likely to have diabetes mellitus (42.7%), while those without diabetes mellitus (57.3%).

| Comorbidities       | Total | Percentage (%) |
|---------------------|-------|----------------|
| Diabetes mellitus   | 44    | 42.7%          |
| Non diabetes mellitus| 59    | 57.3%          |
| Total               | 103   | 100%           |

Source: Dr. Soetomo Hospital Surabaya 2015

From the results of the research, the symptoms of MDR lung TB are fever, hemoptysis, night sweats, chest pain associated with predetermined variables such as gender, age, nutritional status and comorbidities. The results of the research obtained the following results.

1. Sex

The results of the experiments tested with Chi-Square showed that each symptom of MDR pulmonary TB with gender did not show statistically significant relationship because all p> 0.05.

|               | Fever | Hemoptysis | Night sweats | Chest pain | Decreased appetite |
|---------------|-------|------------|--------------|------------|--------------------|
| Male          | 50%   | 36.7%      | 63.3%        | 67%        | 68.3%              |
| Female        | 39.5% | 32.6%      | 67.4%        | 58.1%      | 69.8%              |
| P             | 0.395 | 0.825      | 0.876        | 0.825      | 1.0                |

2. Age

The results of the experiments tested with Chi Square showed that each symptom of MDR pulmonary TB with age did not show statistically significant relationship because all p> 0.05.

|               | Fever | Hemoptysis | Night sweats | Chest pain | Decreased appetite |
|---------------|-------|------------|--------------|------------|--------------------|
| Productive    | 44.6% | 37.0%      | 63.0%        | 58.7%      | 64.1%              |
| Non and Post productive | 54.5% | 18.2%      | 81.8%        | 72.7%      | 81.8%              |
| P             | 0.758 | 0.321      | 0.519        | 0.743      | 0.496              |

3. Nutritional status

The results of the experiments tested with Chi Square showed that each symptom of MDR pulmonary TB with nutritional status did not show statistically significant relationship because all p> 0.05.

Table 7. The frequency distribution of MDR pulmonary TB patients is associated with symptoms of MDR pulmonary TB by nutritional status
patients with chest pain account for about 4% of all tuberculosis cases in the United States and Brazil, while 20% are in South Africa. In Korea, 2,884 new cases of tuberculosis pleuritis were notified in 2012 that accounted for 7.3% of a total of 39,545 new tuberculosis cases and 34% of all tuberculosis cases. The analysis results between sex and decreased appetite had a p value of 0.496 which means there was no relationship statistically. Chest pain in pulmonary TB includes mild pleuritic pain that is affected by immune status. From Chi Square analysis results, it was obtained that relationship of chest pain with nutritional status had p value of 0.414 which means there was no relationship statistically.

Discussion
From the data analysis, it was revealed that the relationship of sex with fever had a p value of 0.395, which means there was no relationship between fever and gender. This is in accordance with research finding conducted by Yondry Kukus et al (2009) who reported that the causes of fever include bacterial disease, brain tumors, and environmental conditions that can end in heat attack. In theory proposed by R.D Myers stated that male sex hormones can increase basal metabolic rate for about 10-15% of normal speed, which causes an increase in heat production. In women, temperature fluctuations are more variable than in men because the ovulation of the hormone progesterone during ovulation increases the body temperature by about 0.3-0.6 °C above basal temperature. The results of analysis between sex and hemoptysis had p value of 0.825 which shows no statistically significant relationship. According to Mason et al (2010), hemoptysis is common in people with smoking and over 40 years of age. The results of analysis between age and night sweats have a p value of 0.395 indicating no statistically significant relationship. The most hemoptysis classification was moderate hemoptysis (34%) with the main etiology of pulmonary tuberculosis (47.6%). From the results of Chi Square analysis, it was revealed that the relationship of night sweat with nutritional status had p value equal to 0.147 which means there was no relation statistically. Based on research conducted by Rumanga, et al (2015), most patients experience symptoms of fever (60%). Fever accompanied by night sweats is a typical symptom in TB patients proven based on the most frequent studies of recurrent type of fever accompanied by night sweats (40%). From Chi Square analysis results, it was obtained that relationship of chest pain with nutritional status has p value of 0.414 which means there was no relationship statistically. Chest pain in pulmonary TB includes mild pleuritic pain that is affected by immune status. From Chi Square analysis results obtained the relationship of decreased appetite with nutritional status had a p value of 0.091 which means there was no relationship statistically.

4. Comorbidities
The results of the experiments tested with Chi Square showed that each symptom of MDR pulmonary TB with comorbidities did not show statistically significant relationship because all p> 0.05.

Table 8. The frequency distribution of MDR pulmonary TB patients is associated with symptoms of MDR pulmonary TB by comorbidities

|                | Fever | Hemoptysis | Night sweats | Chest pain | Decreased appetite |
|----------------|-------|------------|--------------|------------|-------------------|
|                | Yes   | No         | Yes          | No         | Yes               | No                   |
| DM             | 38.6% | 61.4%      | 34.1%        | 65.9%      | 54.5%             | 45.5%                |
| Non DM         | 50.8% | 49.2%      | 35.6%        | 64.4%      | 36.5%             | 64.4%                |
|                |       |            |              |            |                   |                      |
| P              | 0.901 | 0.672      | 0.147        | 0.414      | 0.091             |                      |

Discussion
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From Chi Square analysis results, it was obtained that relationship of fever with diabetes mellitus has p value of 0.30 which means there was no relationship statistically. According to Paramitasari (2015), diabetes can affect the body's ability to fight infection. From Chi Square analysis results, it was obtained that hemoptyosis relationship with diabetes mellitus had a p value of 1.0 which means there was no relationship statistically. According to Retno Wulandari (2013), lung in DM patients will experience pathological changes, such as alveolar epithelial thickening and pulmonary capillary lamina basalisi. From Chi Square analysis result, it was obtained that relationship of night sweat with diabetes mellitus had p value equal to 0.419 which mean there was no relation statistically. Research of Budidarmaja (2013) suggests that if the patient's blood sugar level of 59.4 mg / dl will cause neurologic symptoms of excessive sweating. From Chi Square analysis results obtained relationship of chest pain with diabetes mellitus had p value of 0.714 which means there was no relationship statistically. Chest pain is affected by immune status. From Chi Square analysis results, it was obtained that relationship decrease appetite with diabetes mellitus had p value of 0.223 which means there was no relationship statistically. This is in line with research Renita (2013).

Conclusion
In this study there was no relationship between sex, age, status nutrition and diabetes mellitus with clinical features of patients with MDR lung TB.

Reference
1. Suharyo. 2013. Determinasi Penyakit Tuberkulosis di Daerah Pedesaan. [Skripsi]. Semarang (ID): Universitas Dian Nuswantoro.
2. Aminah, Siti. 2014. Evaluasi Penggunaan Obat Antituberkulosis pada Pasien Tuberkulosis Multi Drug Resistant di Rumah Sakit X Periode Januari-Juni 2013. [Skripsi]. Surakarta (ID): Universitas Muhammadiyah.
3. Revirono, dkk. 2014. Multidrug Resistant Tuberculosis (MDR-TB): Tinjauan Epidemiologi dan Faktor Risiko Efek Samping Obat Anti Tuberkulosis. Surakarta:MKB, Volume 46No.4, Desember 2014
4. Pusadatin. Temukan, Obati Sampai Sembuh. 2015 [on line].
5. Kukus, Yondry et al. 2009. Suhu Tubuh: Homeostasis Dan Efek Terhadap Kinerja Tubuh Manusia. Jurnal Biomedik, Volume 1, Nomor 2,Juli 2009, hlm. 107-118
6. R.D Myers. Mekanisme Temperatur Tubuh [Internet]. 2013 [on line].
7. Irfan, Intan dkk. Gambaran Kejadian Hemoptisis pada Pasien di Bangsal Paru RSUP Dr. M. Djamil Padang Periode Januari 2011 – Desember 2012 [Internet]. 2014 [on line]. Available at: http://journal.flk.unand.ac.id diakses pada 1 Juli 2017
8. Muhtadi. Tuberkulosis. 2013 [on line]. Available at: repository.usu.ac.id/bitstream/123456789/4/Chapter%20II.pdf
9. Jeon, D. Tuberculous Pleurisy: An Update. 2014 [on line]. Available at: