

## CHAPTER VI

### DISCUSSION

Based on the data of all the risk factors collected from the medical records of tetanus patients seeking inpatient treatment at RSUD dr. SAIFUL ANWAR, Malang in the period of 2008 - 2010, the results of the study is discussed below.

The data collected from the medical records of tetanus patients shows a steep rise in the number of tetanus patients receiving treatment compared to the period of 2000 - 2002. Total number of patients received inpatient treatment in 2008 – 2010 was 283 cases while in the period of 2000 – 2002 was just 81 cases (Subiantoro, 2003). This shows an alarming rise in number of patients infected with tetanus disease over the past 6 years in Malang.

The frequency of focal infection (primary infection) among the tetanus patients is highest through the leg in the period of 2008 – 2010 where 219 cases were recorded out of the total 283 cases. This data is similar to the number of patients infected with tetanus disease in the period of 2000 – 2002 where the highest frequency of infection is through the leg where 31 cases out of total 81 cases were recorded (Subiantoro, 2003). The highest frequency of infection through the leg could be due lack of awareness of the people to wear shoes or slippers while working or walking, thus increasing the chances of causing infection of *Clostridium tetani* bacteria through open wounds or by puncture of rusty metal piece on the soil (Mikayla, 2011).

The cause of infection which is more prevalent amongst the tetanus patients seeking treatment is cuts or puncture (216 cases), in the period of 2008 – 2010. Nevertheless, during the period of 2000 – 2002 the highest cause of infection for tetanus patients seeking treatment is cuts or puncture as well (65 cases) (Subiantoro, 2003). The high incidence of patients seeking treatment due to cuts or puncture is because of the nature of the *Clostridium tetani* bacteria itself which is a gram negative obligate anaerobe. *Clostridium tetani* bacteria multiply in the oxygen absent (anaerobic) conditions found in necrotic or infected cuts or puncture wounds, hence leading towards the tetanus disease (Bupa, 2011).

The prevalence of incubation time of 6 – 10 days is the highest among the tetanus patients seeking treatment (165 cases), followed by the incubation time of 11 – 14 days (96 cases) in the period of 2008 - 2010. However the data of tetanus patients in the period of 2000 – 2002 shows that the prevalence of incubation time of 11 – 14 days is higher (50 cases) compared to the incubation time of 6 – 10 days (28 cases) (Subiantoro, 2003). This shift could be due to willingness of public to seek treatment in the hospital when early signs of tetanus disease begin to show, rather than waiting till the disease to become severe (Gotet dkk., 2005).

Prevalence of tetanus disease in the age distribution group of adults (19-59 years) is higher compared to any other age distribution group. The total number of tetanus patients in the adult age distribution group is 175 cases in the period of 2008 – 2010, while in the period of 2000 – 2002 the age distribution group of elderly ( $\geq 60$  years) recorded the highest number of patients (45 cases) seeking treatment for tetanus disease (Subiantoro, 2003). This increase of

tetanus disease among adults (19-59 years) could be due to the economic factor where the growing economy of the developing country increases the hard labor employment for construction works among the adult age group that makes them susceptible for wound infliction during work (Hienfey, 2011)..

Number of male patients infected with tetanus disease is higher compared to the female patients in the period of 2008 – 2010, where 218 out of total 283 cases were male patients. Nevertheless, in the period of 2000 – 2002, the number of male patients was also higher compared to female patients where 60 out of total 81 cases were males (Subiantoro, 2003). The higher number of male infected with tetanus disease could be due to the occupation factor, where males' area of occupation is more active compared to the females, thus wound infliction is more prevalent in males compared to females (Bupa, 2010).

Data obtained from the medical record of tetanus patients shows that prevalence of moderate tetanus is the highest (154 cases) followed by the severe tetanus (100 cases) in the period of 2008 – 2010. However in the period of 2000 - 2002 the prevalence of severe tetanus was higher compared to moderate tetanus (Subiantoro, 2003). In RSUD dr. SAIFUL ANWAR, Malang; Hadi's score is being used to determine the severity of tetanus. Higher number of moderate tetanus severity compared to severe tetanus severity is recorded among tetanus patients could be due to the improvement of service, management and treatment of tetanus patients by the medical personal of the hospital (Gotet dkk., 2005).

Cause of death of tetanus patients which recorded the highest in the period of 2008 – 2010 in RSUD dr. SAIFUL ANWAR, Malang is respiratory failure (53 cases), followed by sepsis (46 cases). Meanwhile, in the period of 2000 –

2002 cause of death that recorded the highest among tetanus patients is respiratory failure (29 cases), followed by pneumonia (13 cases) (Subiantoro, 2003). The increment of sepsis as one of the highest cause of death of tetanus patients could be due to improper first line treatment and management of the wound by the medical personal at RSUD dr. SAIFUL ANWAR, Malang causing wounds such as open wounds, puncture or trauma to be infested with *Clostridium tetani* bacteria, thus leading to the body to have a severe systemic inflammatory response syndrome which is also known as sepsis (Cook dkk., 2011).

The total number of deaths recorded for patients seeking treatment in the period of 2008 - 2010, shows a drastic increment compared to the period of 2000 – 2002. The total number of deaths recorded in 2008 – 2010 is 122 cases; while in the period of 2000 – 2002 were just 42 cases (Subiantoro, 2003). This shows an evident rise in the mortality rate among tetanus patients seeking treatment in in RSUD dr. SAIFUL ANWAR, Malang. Besides, the data also shows that number of deaths increase coherently with the increase in total number of tetanus patients seeking treatment in RSUD dr. SAIFUL ANWAR, Malang.

From the medical records it's found that the antibiotic Metronidazole is main treatment used for all the tetanus patients at RSUD dr. SAIFUL ANWAR, Malang in the period of 2008 – 2010, which is in accordance with the gold standard drug set by the Center of Disease Control (CDC, 2009). Nevertheless, Metronidazole is active against all anaerobic bacteria and the main advantage of Metronidazole is its penetrating capabilities towards the dead tissue (Bupa, 2010). Meanwhile diazepam is also used for about 244 cases out of 283 cases in the period of 2008 – 2010. Diazepam is used for the combined anticonvulsant and muscle relaxation actions on tetanus muscle spasms and rigidity (Edlich

dkk., 2010). Also, it has sedative and anxiolytic effects (MNT, 2011). Bioavailability after oral and rectal administration of diazepam is reported to be good, with almost complete absorption and peak plasma levels occurring within 30-90 minutes (Davis, 2011).

The highest number of tetanus patients seeking treatment at at RSUD dr. SAIFUL ANWAR, Malang in the period of 2008 – 2010, according to the length of hospital stay is less than 4 weeks where 233 cases out of 283 cases were reported. This short length of hospital stays among the tetanus patients is because of the prognosis of the disease where individuals who develop symptoms within a few days of infection have close to a 100 percent mortality rate. The sooner an individual is treated, the more likely he or she is to survive. Recovery for those who survive is normally complete after about four weeks (Salisbury, 2011).

The data shows a relation between the increased number of tetanus patients seeking treatment and the total number of deaths recorded where most of the tetanus patients admitted into RSUD dr. SAIFUL ANWAR are already in the moderate or severe stages of tetanus disease thus increasing the chances of death. Besides, the number of male patients seeking treatment compared to women with the age group of adults (19 – 59) is the highest is because of the occupation factor where most with the age group of adults are hard labors and their work scope is more active, thus wound infliction is more prevalent in adult males. Nevertheless, most of the patient admitted into RSUD dr. SAIFUL ANWAR are already suffering from moderate tetanus, thus increasing the chances of respiratory failure and sepsis which is the highest cause of death among tetanus patients. Moreover, duration of hospital stay has correlation with

the incubation time of tetanus where patients who develop symptoms within a few days of infection have a higher mortality rate compared to the patients with a longer duration of hospital stay (Salisbury, 2011).

The data collection process of the tetanus patients to establish the profile of tetanus patients in the period of 2008 – 2010 in RSUD dr. SAIFUL ANWAR, Malang; from the medical records were hampered due to unavailability of recorded information of some important causal factors and interventions taken on tetanus patients. Besides, important information regarding the patient such as the clinical severity of the disease were also not recorded in some of the medical records. Moreover, hospitals in Indonesia, namely RSUD dr. SAIFUL ANWAR, Malang is still using manual recording of the patients data where important information regarding the tetanus patients are not clearly written in all the medical records and some are even lacking of information such as occupation of the patient and clinical severity of the disease.

