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1G-004

O-INF-001

O-INF-002

Clinical features and outcomes of tetanus cases in Soetomo Hospital Surabaya

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Abstract

Background. Tetanus is a public health problem and the cause of high mortality in developing countries, including Indonesia. The clinical features of these patients in Dr. Soetomo Hospital were described and studied regularly.

Objective. To describe the clinical features and outcomes of pediatric tetanus cases in Soetomo Hospital Surabaya.

Methods. This cross sectional study used data from medical records of children with tetanus infection at pediatric ward Dr. Soetomo Hospital Surabaya from 2009 to 2013.

Results. From 33 patients, only 18 had complete medical records. Male to female ratio was 3.5:1. Eight patients aged were between 0-6 years, mean age was 5.83 (SD 2.08) years, 5/18 patients had received 3 doses of DPT vaccine, 7/18 had evidence of otitis media.

The average of incubation period was 14 (SD 1.39) days and period of onset 3 (SD 3.35) days. The common physical findings were trismus (18/18), rhabdismus sardonicus (13/18), opisthotonus (13/18), tachycardia (10/18), fever (7/18) and hypertension (7/18). The average day of improvement was 4.7 days. Complications were: respiratory failure (4/18), acute kidney injury (2/18) and pneumonia (1/18). Death occurred 2/18 in tetanus cases, all were due to respiratory failure. The mortality rate in severe tetanus was 2/10 patients.

Conclusion. Most pediatric tetanus cases were under 6 years of age, came with trismus and otitis media and have bad immunization history, 2/10 patients of severe cases died, 2/18 in all cases were associated with respiratory failure.

Keywords: tetanus, clinical features, outcome, children.

Association between stomatitis and CD4 count in HIV-AIDS children

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Abstract

Background. The occurrence of opportunistic infections in HIV-AIDS patients is associated with low CD4 count. Stomatitis can be the first clinical sign of the infection and also determine the progression of the disease.

Objective. To determine the association between the occurrence of stomatitis with CD4 count in HIV-AIDS children.

Methods. A cross sectional study was conducted in Dr. Kariadi General Hospital, Semarang. Data were collected from medical record of HIV-AIDS children during of January 2009 until December 2013. Stomatitis and CD4 count were determined. Based on CD4 count, immunodeficiency categorized as severe (<350 cells/mm³) or mild (350-750 cells/mm³). CD4 count of >750 cells/mm³ considered as no immunodeficiency. Statistical analysis was done with independent T-test and chi-square.

Results. Subjects were 42 HIV AIDS children, with mean age of 48 months (SD 44.719) consisted of 20 boys and 22 girls. CD4 count available in 26 patients, according to the category we found 21 children with severe immunodeficiency, 4 children with mild immunodeficiency and 1 child with no immunodeficiency. Stomatitis were found in 23 patients. The mean of CD4 count in stomatitis group was 195.1±332, in no stomatitis was 248.5±212 (P=0.4). In stomatitis group based on CD4 there were 22 patients with severe immunodeficiency (P=0.027, OR=44) with severe immunodeficiency (P=0.009), and 1 patient has no immunodeficiency (P=1.0).

Conclusion. CD4 count was associated with the occurrence of stomatitis in HIV-AIDS children.

Keywords: HIV, AIDS, stomatitis, CD4

CLINICAL FEATURES AND OUTCOME OF TETANUS CASES
IN DR. SOETOMO HOSPITAL SURABAYA

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Abstract

Background: Tetanus is a public health problem and cause of high mortality in developing countries including Indonesia. The clinical features of these patients in Dr. Soetomo Hospital were described and studied regularly.

Objective: To describe the clinical features and outcome of pediatric tetanus cases in Dr. Soetomo Hospital Surabaya.

Methods: This cross sectional study used data from medical records of children with tetanus infection at pediatric ward Dr. Soetomo Hospital Surabaya from 2009 to 2013.

Result: From 33 patients, only 18 had complete medical records. Male to female ratio was 3.5 : 1. Majority of cases (8/18) were between 5 to 6 years, mean age was 5.83 (SD 2.08) years, 5/18 patients had received 3 doses of DPT vaccine. Majority of cases (7/18) had evidence of otitis media. The average of incubation period was 14 (SD 1.39) days and period of onset 3 (SD 3.35) days. The common physical findings were trismus (18/18), risus sardonicus (13/18), opisthotonus (13/18), tachycardia (10/18), fever (7/18) and hypertension (7/18). The average day of improvement was 4.7 days. Complications were respiratory failure (4/18), acute kidney injury (2/18) and pneumonia (1/18). Death occurred 2/18 in tetanus cases, all were due to respiratory failure. The mortality rate in severe tetanus was 2/10 patients.

Conclusion: Most pediatric tetanus cases were under 6 years of age, came with trismus and otitis media and have bad immunization history. Twenty percent of severe cases died, 11.1% were associated with respiratory failure.

Keywords: *tetanus, clinical features, outcome, children.*

BACKGROUND

Tetanus is a major public health problem and cause of high mortality in developing countries and is still encountered in the developed world.¹⁻⁵ The global incidence of tetanus is about 18 cases per 100,000 population per year, with case fatality rate ranging between 20.0 to 50.0% in variation of sexes and ages.¹ It remains endemic in the developing countries of Africa and Asia with high morbidity and mortality.²⁻³ At least 40.0%-50.0% of deaths occur in neonates especially due to unhygienic conditions during birth, improper immunization of pregnant mothers and social practices like smearing cow dung or ghee on umbilical stump.^{2,5}

Tetanus is a potentially fatal disease manifesting itself as painful spasms, autonomic instability and respiratory compromise, caused by 'tetanospasmin' a potent neurotoxin liberated by the organism 'clostridium tetani'.^{1,2,5}

Tetanus is a vaccine preventable disease. Disease classification into mild, moderate, and severe was based on the presence of trismus, risus sardonius, but no spasm; presence of minimal provoked spasms; and sustained and spontaneous spasms and or opisthotonus, respectively.^{2,3}

The diagnosis of tetanus is primarily clinical. History of injury, or presence of a wound aids in strengthening the diagnosis.²⁻⁵ Tetanus typically follows deep penetrating wounds where anaerobic bacterial growth is facilitated. The most common portals of infection are wounds on the lower limbs, postpartum or post abortion infections of the uterus, non-sterile intramuscular injections, and compound fractures.⁴ No definite laboratory abnormalities are present and the CSF is usually normal. Electromyography during tetanic spasms shows continuous discharges of normal motor unit potentials similar to normal forceful voluntary muscle contraction.⁵

Management of this disorder involves a team approach and aims at eradicating focus of infection, neutralizing the toxin with anti-tetanus serum, controlling spasms and dysautonomia and providing adequate ventilatory and supportive care. Metronidazole may be the preferred antibiotic although penicillin is still used frequently. Adequate wound debridement is necessary to prevent spore germination. Spasms are usually managed by sedatives like diazepam and neuromuscular blocking agents. Magnesium sulphate is an attractive substitute and may be tried if ventilatory facilities are unavailable. Use of baclofen is potentially advantageous but cannot be routinely prescribed. Dysautonomia is difficult to

manage, and requires therapy with benzodiazepines, morphine, magnesium sulphate, adrenergic blockers and recently tried baclofen therapy. Supportive care including ventilatory assistance are highly essential for successful outcome of the patients. Nutrition was maintained with high protein pap, given by naso-gastric tube feeding, until patients could tolerate orally. With severe spasms, intravenous fluids were administered until spasms subsided before commencing feeding. Tetanus toxoid (TT) was also given to all patients for active immunization before discharge. Immunization is extremely effective and is the key to prevention. Adequate steps and measures should be taken to increase awareness of this potentially preventable disease.^{2 3 5}

The most common complication was respiratory failure followed by aspiration pneumonia, myoglobinuria due to rhabdomyolysis, hypoxic encephalopathy, acute renal impairment, seizure and upper GI bleeding.² Autonomic disturbances then become a major problem. Sudden cardiac death and the complications of prolonged critical illness (nosocomial infections, particularly ventilator associated pneumonia, generalized sepsis, thromboembolism, and gastrointestinal haemorrhage) become the major causes of death.^{4 6}

Symptomatic management, early recognition of complications, careful monitoring for dysautonomia and respiratory assistance are the anchors for successful outcome.^{2 3 5}

OBJECTIVE

To describe the clinical features and outcome of pediatric tetanus cases in Dr. Soetomo Hospital Surabaya.

METHOD

This cross sectional study used data from medical records of children with tetanus infection at pediatric ward Dr. Soetomo Hospital Surabaya from 2009 to 2013. The diagnosis of tetanus is primarily clinical, as painful spasms, autonomic instability and respiratory compromise.^{2 5} Disease classification into mild, moderate, and severe was based on *Phillips Score* (table 1).^{4 5}

Table 1. Prognostic scoring systems in tetanus: *Phillips score*

Factor	Score
Incubation time:	
<48 hours	5
2-5 days	4
5-10 days	3
10-14 days	2
>14 days	1
Site of infection:	
Internal and umbilical	5
Head, neck, and body wall	4
Peripheral proximal	3
Peripheral distal	2
Unknown	1
State of protection:	
None	10
Possibly some or maternal immunisation in neonatal patients	8
Protected >10 years ago	4
Protected <10 years ago	2
Complete protection	0
Complicating factors:	
Injury or life threatening illness	10
Severe injury or illness not immediately life threatening	8
Injury or non-life threatening illness	4
Minor injury or illness	2
ASA Grade 1	0
total score	

Demographic data including age, sex, clinical features, history of immunization, port d'entry of disease, hematologic/ electrolyte abnormality, complications, therapy and mortality rate (outcome) were analyzed by descriptive analysis.

RESULT

During the study, from 33 patients, only 18 had complete medical records. Majority of cases, 8/18 (44.4%) patients were between 5 to 6 years. Mean age of presentation was 5.8 (SD 2.08) years. Male-to-female ratio was 3.5 : 1 (figure 1).

Among children with tetanus, 5/18 (27.8%) patients received 3 doses of DPT vaccine whereas, 8/18 (44.4%) patients never received DPT and immunization status was unknown in 2/18 (11.1%) patients and 5/18 (27.8%) patients received TT vaccine as tetanus prophylaxis (figure 2). Majority 7/18 (38.9%) patients of tetanus cases resulted from otitis media, ganggren dentis 6/18 (33.3%) and history of trauma 4/18 (22.2%). In 4/18 (22.2%) children there was no recognizable injury preceding

the disease (figure 3). The average of incubation period was 14 (SD 1.39) days and period of onset 3 (SD 3.35) days.

Generalized spasm during the illness in all children. Trismus appeared in all patients (100%). Ophistotonus appeared in 13/18 (72.2%) patients. Risus sardonicus occurred in 13/18 (72.2%) patients. Common autonomic dysfunctions were fever in 7/18 (38.9%) patients, tachycardia 10/18 (55.6%) patients and hypertension 7/18 (38.9%) patients. Pneumonia 1/18 (5.6%) patients, respiratory failure 4/18 (22.2%) patients and acute kidney injury 2/18 (11.1%) patients were common complications.

All of the cases were treated in isolation ward. Tracheostomy was done in 2 cases (11.1%). Diazepam was used to control muscle spasm in all of the cases, with the average day of improvement was 4.7 (SD 2.12) days with range of 4 - 5 days. Antibiotic used was penicillin for all the cases. Broad spectrum antibiotics were added to treat infections like pneumonia, ganggren dentis and otitis media. All improved cases were discharge on oral diazepam. Hematologic abnormality (leukocytosis, trombocytosis) was present in 9/18 (50.0%) cases, electrolyte abnormality (hyponatremia, hypokalemia) was present in 6/18 (33.3%) cases.

Death occurred 2/18 (11.1%) in tetanus cases, all were due to respiratory failure, discharge by request was 2/18 (11.1%) patients.(figure 4). The mortality rate in severe tetanus was 2/10 (20%) patients. The clinical characteristic of subject are shown in table 2.

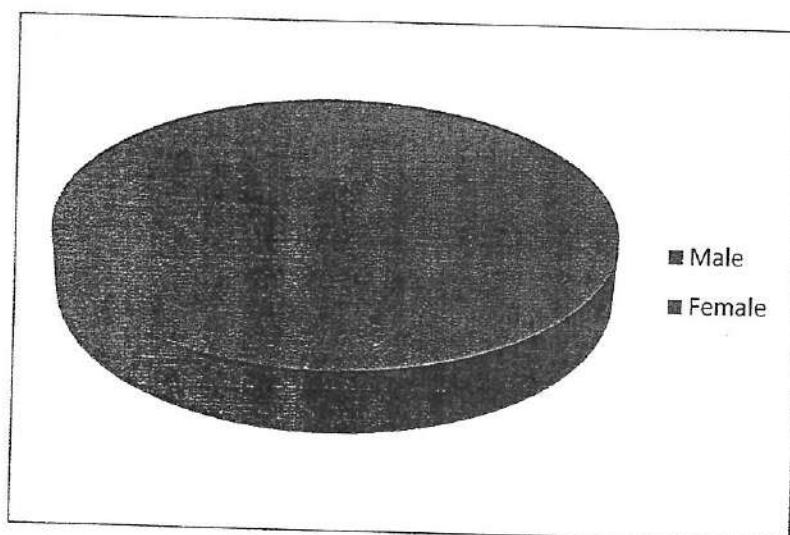


Figure 1. Gender distribution of subjects

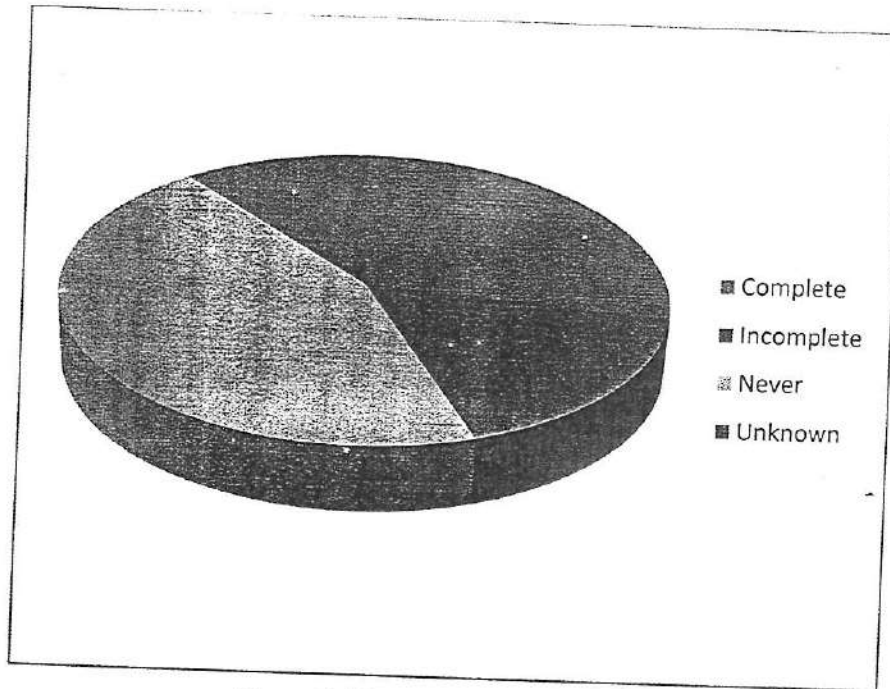


Figure 2. History of immunization

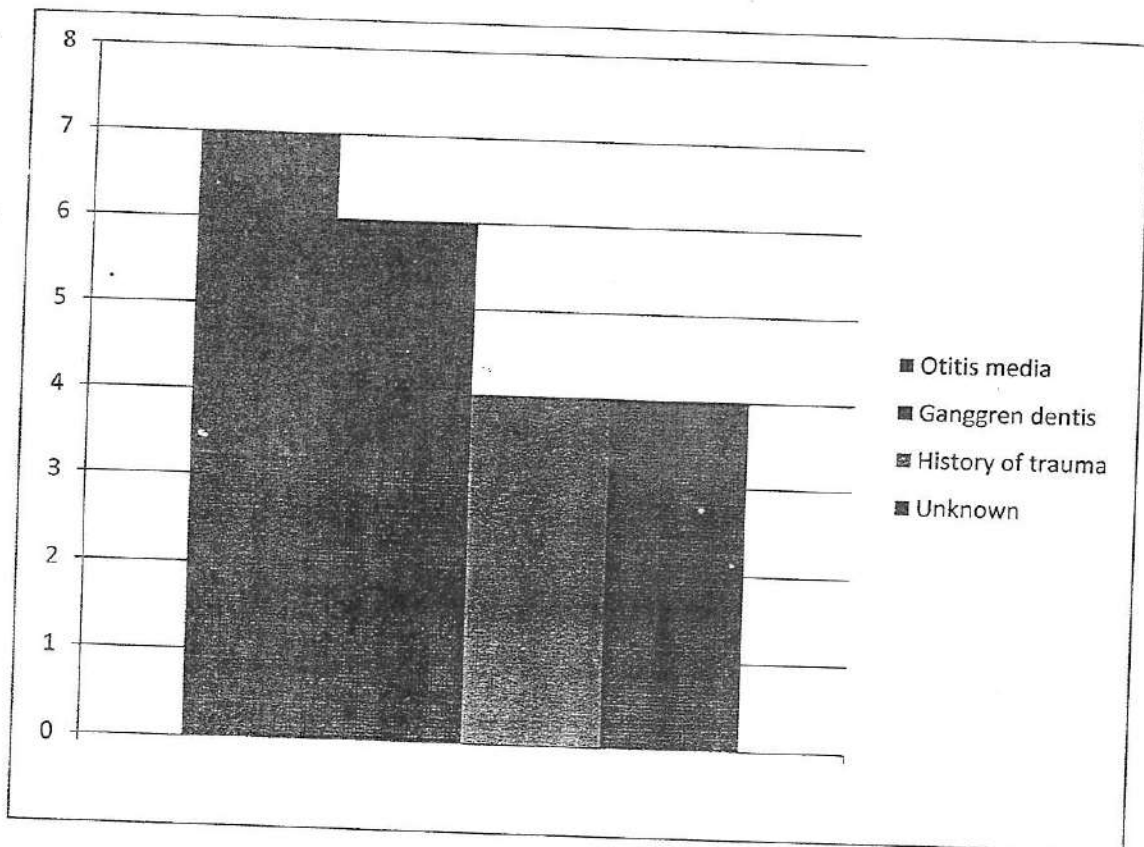


Figure 3. Port d'entry of disease

Table 2. Clinical characteristics of subjects

Mean age of presentation (years) (mean \pm SD)	5.8 \pm 2.08
Sex	
- Boys, n (%)	14 (77.78)
- Girls, n (%)	4 (22.22)
Clinical features	
- Trismus, n (%)	18 (100.0)
- Risus sardonicus, n (%)	13 (72.2)
- Opisthotonus, n (%)	13 (72.2)
- Tachycardia, n (%)	10 (55.6)
- Hypertension, n (%)	7 (38.9)
- Fever, n (%)	7 (38.9)
- Disfagia, n (%)	4 (22.2)
The average of incubation period (days) (mean \pm SD)	14 \pm 1.39
The period of onset (days) (mean \pm SD)	3 \pm 3.35
The average day of improvement (days) (mean \pm SD)	4.7 \pm 2.12
History of tracheostomy, n (%)	2 (11.1)
History of immunization	
- Complete immunization, n (%)	5 (27.8)
- Incomplete immunization, n (%)	3 (16.7)
- Never immunization, n (%)	8 (44.4)
- Unknown, n (%)	2 (11.1)
Port d'entry	
- Otitis media, n (%)	7 (38.9)
- Ganggren dentis, n (%)	6 (33.3)
- History of trauma, n (%)	4 (22.2)
- Unknown, n (%)	4 (22.2)
Hematologic abnormality, n (%)	9 (50.0)
Electrolyte abnormality, n (%)	6 (33.3)
Complications	
- Respiratory failure, n (%)	4 (22.2)
- Acute kidney injury, n (%)	2 (11.1)
- Pneumonia, n (%)	1 (5.6)
Outcome	
- Discharged	14 (77.8)
- Discharged by request	2 (11.1)
- Death	2 (11.1)

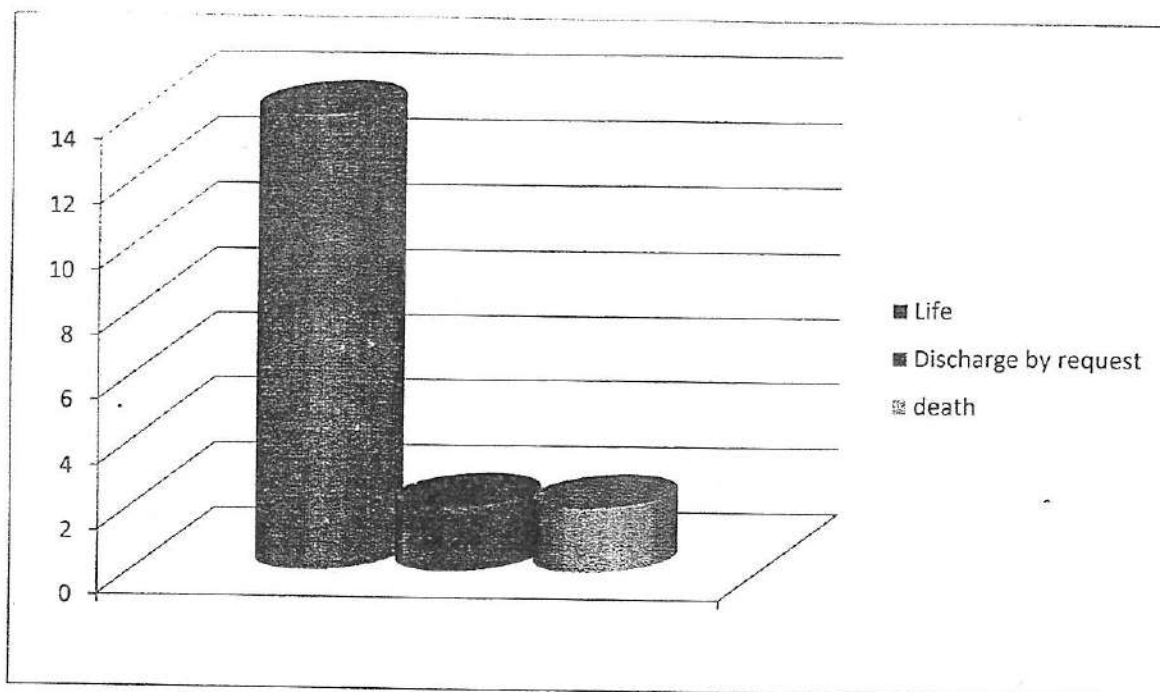


Figure 4. Outcome of disease

DISCUSSION

In this study, the average of incubation period was 14 (SD 1.39) days and period of onset 3 (SD 3.35) days. The incubation period (the time from inoculation to the first symptom) can be as short as 24 hours or as long as many months after inoculation with *C tetani*. This interval is a reflection of the distance the toxin must travel within the nervous system, and may be related to the quantity of toxin released. The period of onset is the time between the first symptom and the start of spasms. These periods are important prognostically, the shorter the incubation period or period of onset the more severe the disease.⁴

Majority of tetanus cases in this study resulted from otitis media, with unknown causes in 22.2% patients. Minor trauma can lead to disease and in up to 30% of patients no portal of entry is apparent. Tetanus has been reported after a myriad of injuries, including intravenous and intramuscular injections, acupuncture, earpiercing, and even from toothpicks. It can follow from chronic infections such as otitis media and has been reported via a decubitus ulcer.¹⁴

The common physical findings of tetanus cases in our study were trismus, risus sardonicus, opisthotonus, tachycardia, fever and hypertension. The diagnosis is a clinical one, based on the presence of trismus, risus sardonicus, spasm and or

opisthotonus, relatively easy to make in areas where tetanus is seen often, but often delayed in the developed world where cases are seen infrequently. The differential includes tetany, strychnine poisoning, drug induced dystonic reactions, rabies, and orofacial infection. In neonates the differential diagnosis would also include hypocalcaemia, hypoglycaemia, meningitis and meningoencephalitis, and seizures. Autonomic disturbance with sustained labile hypertension, tachycardia, vasoconstriction, and sweating is common in severe cases.²⁻⁴

Antibiotic used was penicillin for all the cases in this study. Broad spectrum antibiotics were added to treat infections like pneumonia, ganggren dentis and otitis media. Penicillin remains the standard therapy for tetanus in most parts of the world, although antibiotics for *Clostridium tetani* probably play a relatively minor part in the specific treatment of the disease. The dose is 100.000 – 200.000 IU/kg/day intramuscularly or intravenously for 7 to 10 days. Metronidazole is a safe alternative, and may now be considered as the first line therapy. Erythromycin, tetracycline, vancomycin, clindamycin, doxycycline, and chloramphenicol would be alternatives to penicillin and metronidazole if these were unavailable or unusable in individual patients.⁴ Diazepam was used to control muscle spasm in all of the cases. Diazepam is the mainstay of treatment.²

Among children with tetanus in this study, 8/18 (44.4%) patients never received DPT. Passive immunisation with human or equine tetanus immunoglobulin shortens the course and may reduce the severity of tetanus. Passive immunisation should be administered as soon as possible after the injury. In addition to passive immunisation, active vaccination needs to be administered to all patients, so called active-passive immunization.^{1 4} The toxoid and the human (or equine) antitetanus immunoglobulin should be administered at different sites on the body to prevent interaction at the injection site. If both are to be administered together no more than 1000 IU human or 5000 IU equine antitetanus immunoglobulin should be administered, higher doses can neutralize the immunogenicity of the toxoid.⁴

Neonatal tetanus can be prevented by immunisation of women during pregnancy. Two or three doses of absorbed toxin should be given with the last dose at least 1 month before delivery. Immunity is passively transferred to the fetus and protective antibodies will persist long enough to protect the baby.⁴

Death occurred 2/18 (11.1%) in this study, all were due to respiratory failure. Respiratory failure is the commonest direct cause of death from tetanus in the

developing world, particularly when artificial ventilation may not be available for every case.²⁴

CONCLUSION:

Most pediatric tetanus cases were under 6 years of age, came with trismus and otitis media and have bad immunization history. Twenty percent of severe cases died, 11.1% were associated with respiratory failure.

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LEMBAR PENGUMPUL DATA

Tetanus

1. Identitas pasien :

- Nama : No. RM :
- Usia/Tgl. Lahir : Laki / Perempuan
- Alamat :
- Suku Bangsa :
- Telepon :
- Ayah : Ibu :

nama:

Usia :

Pendidikan :

Pekerjaan :

2. Riwayat penyakit :

- Keluhan utama :
- Gejala klinis :
 - panas kejang kaku otot
 - trismus kaku kuduk sesak
 - risus sardonikus disfagia takikardia
 - bradikardia rwy trauma, kapan:
 - keluar cairan telinga gigi lubang opisthotonus
 - imunisasi : DPT I DPT II DPT III bumil, usia
 - rwy epilepsi lesi, letak:

- Karakteristik klinis :
 - kesadaran : GCS Nadi RR Temp. SpO2
 - berat badan
 - tinggi badan tekanan darah status gizi :
 - kepala leher :
 - thorak : jantung :
paru :
 - abdomen :
 - ekstremitas :

3. Laboratorium (tanggal :)

darah lengkap	
LED	
CRP	
albumin	
SGOT/ SGPT	
BUN/ SK	
GDA	
SE (Na, K, Cl, Ca)	
BGA	
Urinalisis	
kultur darah	
analisa LCS	

4. Diagnosis : Skor Surabaya: Tetanus Ringan / Sedang / Berat
 Skor Phillips : Tetanus Ringan / Sedang / Berat

5. Terapi :

- Diazepam :

- MgSO4 :

- Antibiotik :

- Anti tetanus serum :

- HTIG :
- Imunisasi :
- Ventilator : jika ya, lama
- Tracheostomi : jika ya, lama
- Intubasi : jika ya, lama
- Debridement :
- Lama perawatan : Ruang rawat :

- Outcome :

6. Imaging :

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Indonesian Pediatrics Society

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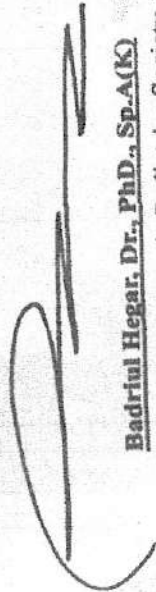
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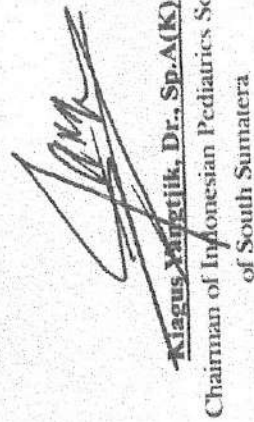
has attended the 16th Indonesian Congress of Pediatrics (KONIKA XVI)

"Towards Global Equalities in Sustainable MDG's
Achievements Through Comprehensive Health Care, for All Indonesian Children"

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PARTICIPANT


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President of Indonesia Pediatrics Society


Kisgus Mardijk, Dr., Sp.A(K)
Chairman of Indonesian Pediatrics Society
of South Sumatera


M. Nazir, Dr., Sp.A(K)
Chairman of the 16th KONIKA

This program has been accredited by Indonesian Medical Association (IMA/IDI) with maximal credit points of 30 (participant), 1 (speaker),
and by Indonesian Pediatrics Society (IPS/IDAI) as category I and V CPD (No. 6754/CPD- I/Apl/2014 and 6755/CPD-V/Apl/2014)
SK PB IDI No.1223/PB/A.4/08/2014: participant 15, speaker 12, moderator 4, committee 3.