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ARTICLES

Analisa Biaya Pengobatan Pasien Rawat Inap Orang Dengan Gangguan Jiwa (ODGJ) dengan diagnosa COVID-19 di Rumah Sakit X periode Mei – Juli 2021

Oktavia Anggrainy, Piter Piter, Yelfi Anwar

01-17



Hubungan Pengetahuan Dan Sikap Tentang Kesehatan Reproduksi Dengan Perilaku Seks Pranikah Pada Siswa SMK Puspa Bangsa Cluring, Banyuwangi

Lujeng Galih P, Ratih Eka F

18-27



ANALISIS PENGATURAN DIET TINGGI SERAT PADA ORANG DENGAN PERLEMAKAN HATI NON ALKOHOLIK

Suminah Suminah

28-32



DESCRIPTION OF THE INCIDENCE OF POST OPERATIVE NAUSEA AND VOMITING (PONV) IN CURETTAGE SURGERY PATIENTS

Siti Mirhalina Hasibuan, Wahyu Adi Pratama

33-42



IDENTIFIKASI BAKTERI KONTAMINASI PADA RUANG INFEKSI MENULAR LEWAT TRANSFUSI DARAH (IMLTD)

Widia Rahmatullah, Frisilia Gryas Triesyulianti, Shinta Shinta

43-55



PERMETHRIN POTENTIAL AS AN ALTERNATIVE THERAPY FOR THE ERADICATION OF CUTANEOUS LARVA MIGRANS (CLM) - CASE REPORT

Sukmawati Tansil Tan, Yohanes Firmansyah, Hendsun Hendsun

56-61



THE RELATIONSHIP BETWEEN OBESITY AND THE HABIT OF CONSUMING SUGAR-SWEETENED BEVERAGES ON FASTING BLOOD GLUCOSE LEVELS IN ADULTHOOD (Case: Puskemas Tanjung Morawa)

Siti Mirhalina Hasibuan, Nada Rizki Hanifah

62-70



ANALISIS PELAKSANAAN INFORMED CONSENT PADA PASIEN BERSALIN DI PRAKTIK MANDIRI BIDAN ELY FARIDAH

Galuh Permatasari, Gladeva Yugi Antari, Luh Putu Sri Yuliasuti

71-79



EFEKTIVITAS PENYULUHAN KANKER SERVIKS MENGGUNAKAN METODE MEDIA LEAFLET DAN MEDIA VIDIO TERHADAP MOTIVASI DAN SIKAP MELAKUKAN SKRINING IVA PADA IBU TP-PKK KAB. SUMBAWA

Fitri Setianingsih, Yunita Lestari, Luh Putu Sri Yuli Astuti

80-88



Terapi Reperfusi Coronary Artery By Pass Grafting (CABG) Minimal Invasif dan Percutaneous Coronary Intervention (PCI)

I Gede Sumertana Jaya

89-97



Angka Kuman Susu Formula Pasca Seduh pada Penyimpanan Suhu Lemari Pendingin dengan Variasi Lama Penyimpanan

Mamay Mamay, Iin Patimah, Ernawati Ernawati, Aldi Renaldi Septian

98-107

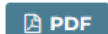


EFEKTIFITAS PENDIDIKAN BENCANA TERHADAP KAPASITAS EVAKUASI DIRI DARI DALAM KELAS SAAT GEMPA BUMI SISWA TK RA. AL-MUNAWWAROH LEMBANG

THE EFFECTIVENESS OF DISASTER EDUCATION ON THE CAPACITY OF SELF-EVACUATION FROM THE CLASSROOM DURING AN EARTHQUAKE OF KINDERGARTEN RA STUDENTS. AL-MUNAWWAROH LEMBANG

Triwulan Anggraeni, Untung Sudharmono

108-115

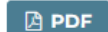


EFEKTIFITAS LAGU DALAM PROGRAM PENGURANGAN RESIKO BENCANA GEMPA BUMI SISWA PAUD RA. AL-MUNAWWAROH LEMBANG

THE EFFECTIVENESS OF THE SONG IN THE EARTHQUAKE DISASTER RISK REDUCTION PROGRAM OF PAUD RA STUDENTS. AL-MUNAWWAROH LEMBANG

Maria, Untung Sudharmono

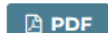
116-123



Peningkatan Kapasitas Paru Dengan Metode Ballon Blowing Relaxation Pada Perokok Aktif

Nian Afrian

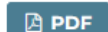
124-133



DETERMINATION OF WATER SOLUBLE AND ETHANOL SOLUBLE CONTENT OF MATOA (Pometia pinnata J. R. Forst & G. Forst) LEAVES

Ellen Stephanie Rumaseuw, Febriana Imelda

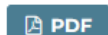
134-142



Korelasi Hemoglobin Dengan Indek Masa Tubuh dan Tekanan Darah Sebagai Skrining Pencegahan Stunting pada Remaja

Resmi Aini, Windadari Murni Hartini, Neini Nur'avia, Suci Lestariani

143-150



Korelasi Hemoglobin Dengan Indeks Masa Tubuh dan Tekanan Darah Sebagai Skrining Pencegahan Stunting pada Remaja

Resmi Aini, Windadari Murni Hartini, Neini Nur'avia, Suci Lestariani

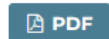
143-150



Examination of urine protein in elderly people at posyandu beringin V Kedungwuni Barat Sub-District With The Dipstic Method

Fitria ningsih, Subur Wibowo

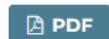
151-168



Perbedaan Jumlah Trombosit Pasca Transfusi Thrombocyte Concentrate Dan Thrombocyte Apheresis Pada Pasien Trombositopenia

Rudina Azimata Rosyidah , Novia Anjani, Windadari Murni Hartini, Ana Mardiyarningsih

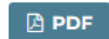
169-182



Faktor-Faktor Yang Mempengaruhi Ibu Dalam Pemberian Asi Berdasarkan Peran Ayah Dan Keluarga Di Desa Sigumpar Kecamatan Sigumpar Kabupaten Toba Tahun 2023

Jane Wilda Irmawati Sirait

183-190



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PERMETHRIN POTENTIAL AS AN ALTERNATIVE THERAPY FOR THE ERADICATION OF CUTANEOUS LARVA MIGRANS (CLM) - CASE REPORT

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ABSTRACT

Creeping eruption is an infection of the skin due to active penetration and migration of nematode larvae to the epidermis of the skin. Although clinically, this disease is easy to treat; the incidence of Anthelmintic drug resistance should be considered because reports of Anthelmintic drug resistance have been around since 1957 among livestock. This case report discusses the innovative treatment for creeping eruption using 5% permethrin, commonly used for scabies and pediculosis. Reportedly, a 29-year-old woman with two serpiginous lesions in the right femoral region who was intervened with 5% permethrin cream for ten days proved effective in treating “creeping eruptions.” The patient admitted that he was very satisfied with the treatment without any side effects

Keyword: *creeping eruption; cutaneous larva migrans; alternative therapy; permethrin; drug resistance*

ABSTRAK

Erupsi merayap adalah infeksi pada kulit akibat penetrasi aktif dan migrasi larva nematoda ke epidermis kulit. Meski secara klinis, penyakit ini mudah diobati; kejadian resistensi obat Anthelmintik harus diperhatikan karena laporan resistensi obat Anthelmintik sudah ada sejak tahun 1957 di kalangan ternak. Laporan kasus ini membahas pengobatan inovatif untuk erupsi merayap menggunakan permetrin 5%, yang biasa digunakan untuk kudis dan pedikulosis. Dilaporkan, seorang wanita berusia 29 tahun dengan dua lesi serpiginous di daerah femoralis kanan yang diintervensi dengan krim permetrin 5% selama sepuluh hari terbukti efektif dalam mengobati “erupsi merayap.” Pasien mengaku sangat puas dengan pengobatan tanpa efek samping

Kata kunci: erupsi merayap; migran larva kulit; terapi alternatif; permetrin; resistensi obat

1. INTRODUCTION

Creeping eruption is a form of clinical manifestation raised on the skin in pruritic serpiginous and hyperemia caused by the active penetration and migration of animal hookworm larvae into the epidermis of the skin. Larvae that commonly cause creeping eruption abnormalities are *Ancylostoma braziliense* and *Ancylostoma caninum*, which are commonly found in dogs and cat. [1], [2]

In general, creeping eruptions are self-limiting within 2 to 8 weeks, but patients often come to the doctor because the pruritus is very severe and requires further symptomatic therapy. The definitive therapy for creeping eruptions is Anthelmintik therapy, namely Albendazole, at a dose of 10-15 mg/kg body weight or 400 mg as a single dose in adults. [2] Another alternative treatment is the use of ivermectin at a dose of 150 µg / kg (12 mg single dose for adults), the use of 10% thiabendazole gel [3], and ivermectin 1% cream topically. [4]

Creeping eruption or cutaneous larva migrans (CLM) is an infectious disease that is easy to treat. But problems began to arise due to the irrational use of Anthelmintic drugs, especially in livestock. Various reports since 1983 stated that there are various types of worms and larvae that have begun to adapt to several Anthelmintic such as macrolitic lactones (Ivermectin), levamisole (Lev), and benzimidazole (BZ) in Australia and Indonesia. There have been no specific reports on the prevalence of Anthelmintic resistance of larvae and worms in humans, but reports in Australian animal husbandry suggest that cases of Anthelmintic resistance in livestock have reached 80%. [5]

2. CASE REPORT

A 29-year-old woman presented with a prominent reddish rash and itching since ten days ago on her upper left thigh. (Image 1). The skin lesions first appear as reddish patches that progressively lengthen and twist like worms under the skin. The patient has a history of vacationing to the beach and wearing shorts.

A dermatological examination identified two skin lesions in the right femoral region that curved to form hyperemic serpiginous efflorescence with erosions surrounding the lesions. (Image 1). Efflorescence and patient history are used to diagnose Creeping eruption or Cutaneous Larva Migrans. The patient consented and signed an informed consent form for topical Permethrin 5% cream treatment. The recommended application of permethrin 5% is twice daily, two weeks after bathing. Additionally, patients are required to document any adverse effects resulting from this treatment. The patient was scheduled to return on day 2 after the skin lesions had completely resolved, leaving hyperpigmented post-inflammatory patches (Figure 2). The patient admitted that he was extremely pleased with the final, side-effect-free result of this treatment.

	
<p>Figure 1. Two serpiginous lesions in the right femoral area</p>	<p>Figure 2. Total resolution of the right femoral area by leaving post-inflammatory hyperpigmented lesions after using 5% permethrin cream for 2 weeks</p>

3. DISCUSSION

Empirically, the first-line therapy for creeping eruptions and Cutaneous larva Migrans is in the form of ivermectin, thiabendazole, Albendazole, and pyrantel pamoate according to the requirements of each country. In Indonesia alone, the main drugs of choice for treating creeping eruptions are albendazole and pyrantel pamoate, with a cure rate of more than 94%. [2] But problems began to arise due to the irrational use of drugs, especially Anthelmintik drugs for animal husbandry. Research from James discusses that the actual incidence of resistance and adaptation mechanisms of larvae and worms to Anthelmintik drugs has occurred since 1957. An ironic thing happened is that resistance to Anthelmintik drugs occurred only three years after the drug was introduced (Benzimidazole, introduced in 1961 and the incidence of resistance was reported in 1964), as well as other Anthelmintik drugs whose resistance mechanism occurs under ten years (except phenothiazines) (Figure 3) [6], [7]

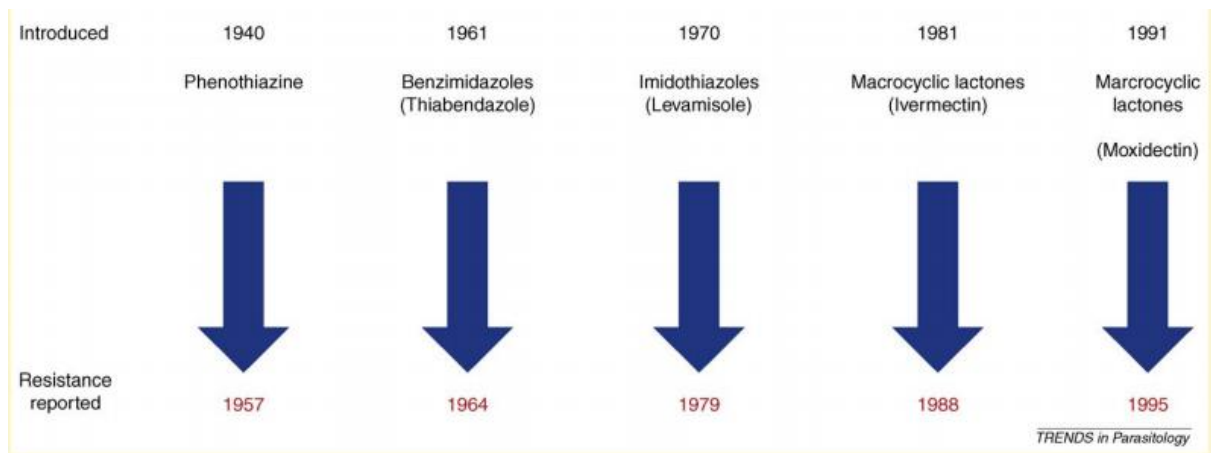


Figure 3. Timeline of Various Anthelmintik Drugs from Introduction to Resistance
[6], [7]

Although there have been no reports of human cases of anthelmintic resistance, it is necessary to use alternative drugs to treat cases of anthelmintic resistance, particularly for cutaneous disease larva migrans. One of the therapies highlighted is permethrin, which is generally used as an anti-pediculosis and anti-scabies with a pathogen eradication rate of 97-99%. [7], [8] Permethrin belongs to the pyrethrin and pyrethroid groups which in their mechanism of action are neurotoxic or damage the central and peripheral nervous system of the target. Permethrin will cause repeated impulse release as a result of persistently opening sodium channels. The end result of repeated release and persistent opening of sodium channels is damage to peripheral and central nerves as a side effect of excessive reabsorption of sodium in cells. [7] The end of this first phase has an impact on the target paralysis, which is sublethal

The second phase of the pyrethrin and pyrethroid effects is the continuous production of amplitude as a result of the sodium channel remaining open until it exceeds the maximum load tolerance threshold of the cell in order to maintain pump activity.[7] The result of this phase and the lipophilicity properties of this drug gives the effect of better paralysis and mortality due to better absorption rates. [9], [10]

Permethrin is included in the pyrethroid type I class, which has good paralyzing potential for insects and worms because it can induce persistent axon excitation. The impact of continuous excitation on the bodies of worms and insects is a loss of coordination and awareness of the target, which causes death. [7], [11]. Some compounds are more potent than permethrin, namely pyrethroid type II or deltamethrin compounds, causing axon depolarization and irreversible nerve damage (the ability to modify sodium channels is up to 100 times longer). Still, their use in humans is considered inappropriate because side effects are not yet known. [12]

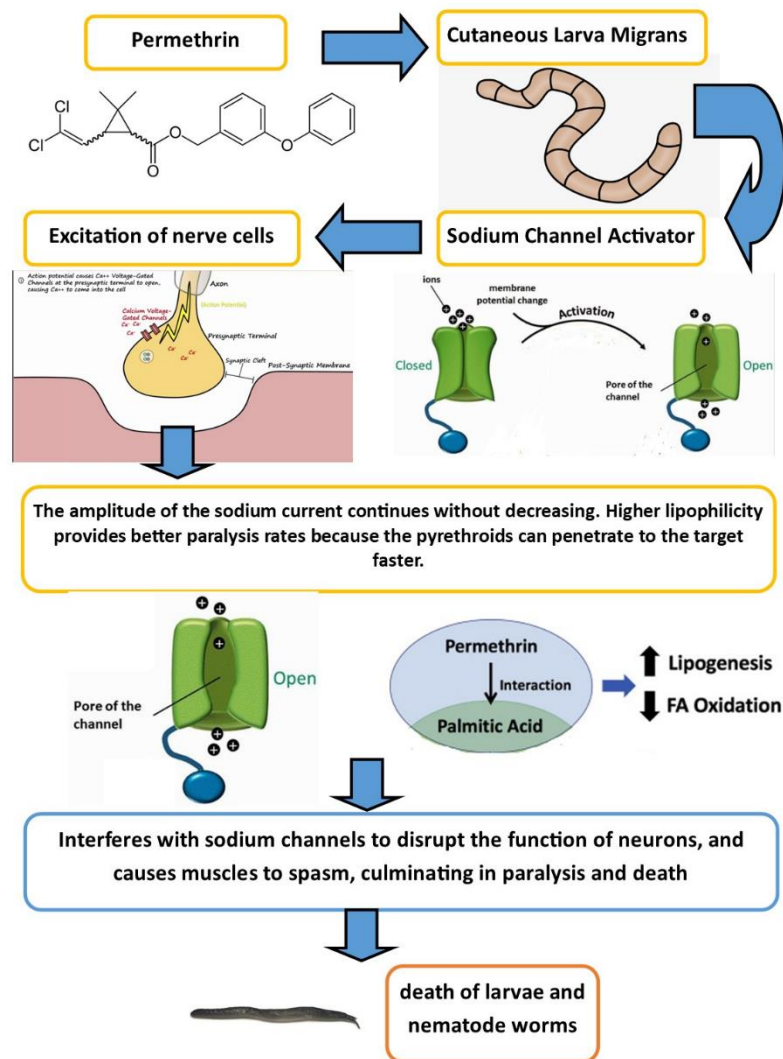


Figure 4. Mechanism of permethrin in the eradication of cutaneous larva migrans (CLM)

4. CONCLUSION

Creeping eruption is an infectious disease caused by nematode larvae and often disturbs humans. The incidence of Anthelmintic resistance was reported since 1957. Therefore it is necessary to find a new medical innovation to treat cutaneous larva migrans or creeping eruptions. This case report discusses the effectiveness of 5% permethrin topically in treating creeping eruptions for 2 weeks without any side effects. This treatment can be suggested as an easy and cheap therapy for CLM

Acknowledgement and Ethical Clearance

The Universitas Tarumanagara Human Research Ethics Committee Institute of Research and Community Engagement gave ethical approval for the intervention used in this study (Register Number: PPZ20202075 and Letter Number: 1057-Int-KLPPM/Untar/VII/2020).

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