A CASE STUDY ON DEMODICOSIS IN DOGS IN CLINIC
DR. SETYO WIDODO DKK

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FACULTY OF VETERINARY MEDICINE
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2017
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ABSTRACT

FOO FEI MAY. A case study on Demodicosis in dogs in clinic Dr. Setyo Widodo DKK. Under the supervision of SETYO WIDODO and LENI MAYLINA

Demodicosis is one of the serious skin disease caused by the increase population of Demodex sp. mites. The aim of this study is to identify the clinical symptom of dogs infected by demodicosis as well as to identify the effective therapies for this skin disease. This study case was conducted using secondary data in vet clinic of Dr. Setyo Widodo DKK. A total of 22 dogs were analyzed in the time frame of January 2015 to March 2017. In this study case, among these 22 dogs the clinical signs that appears the most is pruritus for 68.2% out of 22 dogs. Erythema for 40.9% out of 22 dogs and alopecia for 36.4%. All patients were given therapies and the most effective therapies among all were Ivermectin for 72.7% out of 22 dogs, Promectin for 22.7% out of 22 dogs and Erythromycin for 40.9%.

Key words: dogs, demodicosis
ABSTRAK

FOO FEI MAY. Studi kasus demodekosis pada anjing di klinik Dr. Drh Setyo Widodo DKK. Di bawah bimbingan SETYO WIDODO dan LENI MAYLINA.

Demodekosis adalah salah satu penyakit kulit yang serius yang disebabkan oleh peningkatan populasi Demodex sp. Tujuan dari studi kasus ini adalah untuk mengidentifikasi gejala klinis pada anjing yang terinfeksi demodekosis serta mengidentifikasi terapi yang paling efektif untuk penyakit kulit ini. Studi kasus ini menggunakan data sekunder dari klinik hewan Drh. Setyo Widodo DKK. Data rekam medis banyak 22 ekor anjing diamati dari Januari 2015 hingga Maret 2017. Pada studi kasus ini, gejala klinis yang paling banyak diamati dari 22 ekor anjing adalah pruritus sebanyak 68.2% dari 22 ekor anjing, Eritema sebanyak 40.9% dari 22 ekor anjing and alopecia sebanyak 36.4%. Semua hewan diberikan terapi dan terapi yang paling efektif adalah pemberian Ivermectin sebanyak 72.7% dari 22 ekor anjing, Promectin sebanyak 22.7% dan Eritromisin sebanyak 40.9%.

Kata kunci: anjing, demodekosis
A CASE STUDY ON DEMODICOSIS IN DOGS IN CLINIC DR. SETYO WIDODO DKK

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In Faculty of Veterinary Medicine
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PREFACE

This undergraduate thesis is submitted as part of the requirements for a Bachelor’s Degree in Veterinary Medicine from the Veterinary Faculty of Bogor Agricultural University. Praise and grace to the Lord for His guidance and blessings during the writing of this undergraduate thesis. The thesis entitled “A Case Study on Demodicosis in dogs in Clinic Dr. Setyo Widodo DKK” was done in the Department of Veterinary Clinic, Reproduction and Pathology.

My supervisors on this project is Drh Setyo Widodo, PhD and Drh Leni Maylina, MSi, who have been the ones who motivated me and encouraged me through the whole process of this project. The writer would like to thank supervisors on this project, family and friends who had given great encouragement and support throughout the whole process of completing this thesis. Special thanks to Drh. Vetnizah Juniantito, PhD, APVet and Drh. Rahmat Hidayat, MSi who had always given me great advise throughout my time here as a degree student as well as all the staffs here at Faculty of Veterinary Medicine. Writer hopes this thesis can be beneficial for all readers.

Bogor, June 2017

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INTRODUCTION

Background

Dogs are one of the most common animal we keep as pet, companion, therapy, service animal, security and others. Due to many types of fur in different breeds of dogs in countries with various weather and environment, skin disease became a common health complication in dogs. Canine demodicosis is a condition where *demodex sp.* mites proliferates and exceed the normal amount. This skin disease is also known as demodectic mange, follicular mange or red mange (Miller *et al.* 2013).

*Demodex sp.* are parasites that have strong specificity when choosing a host, in some cases though rare, two different species of the same mite cohabit in the same host (Rojas *et al.* 2012). Some ectoparasite infection, although mild can sometimes bring discomfort for animals and causes severe itching, skin lesions and chronic skin diseases. Mites spend most of their life cycle in epidermis, underneath the surface of the skin and are able to cause severe interference and they feed on skin cells, sebum and epithelial debris.

According to Zhao *et al.* (2009), the survival time of *demodex sp.* is highly depended on the surrounding temperature. It was discovered that mites’ activeness decreased gradually as the temperature decrease and could only survive for around 5.5 hours at -15°C. The optimal temperature for the survival and breeding of mites is 29-30 °C. For the reasons stated above, a study was done in 22 dogs that came into vet clinic of Dr. Setyo Widodo DKK.

Objective

The objective of this case study is to identify the clinical symptom of dogs infected by demodicosis that is caused *Demodex sp.* Other than that, this study also aims to identify the effective therapies for this skin disease.

Benefit

The benefits that can be provided from this case study are informations and clinical guideline in identifying demodicosis through clinical symptom. This study case also provides informations on the efficient and effective therapies for it.
LITERATURE REVIEW

Overview of Demodicosis

A dog’s skin has 3 major layers: the outermost layer is epidermis, the middle layer is dermis and the innermost layer is subcutis. The skin provides a protective barrier against the environment and regulates temperature. The epidermis is the primary protection against foreign substances and consists of various types of cells such as keratinocytes, melanocytes, Langerhans cells, and Merkel cells. The Langerhans cells function as part of the immune system and are easily damaged when exposed to excessive ultraviolet light and glucocorticoids. This particular cell plays an important role in the skin’s response to foreign substances and allergy reactions (Moriello et al. 2015).

Demodex sp. mites are considered a normal part of the microflora that can be found on the dog’s skin and this disease can be transmitted from an infected mother to pup in just a few days. Demodex sp. mites that are most commonly found in dogs are demodex canis, demodex cornei and demodex injai and the difference between these three species is the morphology of the body (Miller et al. 2013). Demodex injai has longer body length of around 361 microns as shown in figure 1 B and are more often found on animals with more oily skin and fur (Ordeix and Bargadi et al. 2009) while on the other hand, D. canis as shown in figure 1 A and D. cornei as shown in figure 1 C has shorter body. Demodex injai is twice the length of D. canis and this is the species that is part of the normal cutaneous flora in dogs and are usually kept low in numbers by a dog’s immune system and this species of demodex sp. mite lives limited to the hair follicles. On the other hand, D. injai tends to reside within sebaceous glands. Demodex cornei is a short-bodied demodex species and it is found that this particular species unlike others, prefers to reside in the most superficial layer of the epidermis and is around 50% shorter than the adult form of D. canis (Tater and Patterson 2008).

![Figure 1 A Microscopic view (40x) of an adult D.canis (Miller et al. 2013).](image)

![Figure 1 B Microscopic view (40x) of an adult D. injai (Miller et al. 2013).](image)

![Figure 1 C Microscopic view (50x) of an adult D. cornei (Miller et al. 2013).](image)
Based on an observation done by Janczak et al. (2017), the adult mite of *demodex sp.* is divided into three segments. The front segment, the mouth part, is gnatosoma, the middle part with legs is called podosoma and the worm-shaped tail that often has a striated surface part is called opistosoma.

Demodex canis is the species that is most commonly found in dogs and is considered a normal resident of a dog’s skin and ear canal. It is a white oblong mite and adult female measures up to 40 to 300 µm and adult males measure 40 µm. This mite has clear mandibles at its horseshoe-shaped capitulum and its outer cuticula resembles transverse wrinkles. It has four pairs of stump-like legs, each leg ends with two claw-like structures. This mite spends all four stages of its life cycle on the skin, residing in hair follicles. The developmental cycle of Demodex canis starts with the hatching of larva from a fusiform egg. The six-legged larva molts and becomes an eight-legged nymph. This nymph then continues to molt and produce a mite in the final adult stage. The mites take around three weeks to complete this cycle and all stages of development can be found in a dog’s hair follicles, lymphatic system, bloodstream and other organs. The total lifespan of a *demodex sp.* mite several weeks and the development from a six-legged larva to an adult takes about 7 days. It was discovered mites of all stages can be found in lymph nodes, intestinal wall, spleen, liver, kidney, urinary bladder, lung, thyroid gland, blood, urine and feces. However, mites that are found in extracutaneous locations are usually dead and have been moved by lymph or blood drainage (Miller et al. 2013). Below is a diagram picturing the life cycle process of D. canis.

![Diagram of the life cycle of Demodex canis (Ferrer et al. 2014)](image)

Based on figure 2 above, the life cycle of a mite starts with female mites laying eggs in the follicles and glands of a dog. Inside the follicles and glands, eggs hatch into six-legged larvae and then continue to develop into eight-legged nymphs and later on,
nymphs molt into eight-legged adults. It takes around 7 days for the development of an egg into an adult mite.

Pathogenesis of Demodicosis

Demodicosis is divided into two types which is localized demodicosis and generalized demodicosis. The prognosis of localized demodicosis is far better compared to generalized demodicosis. When infected areas by *demodex sp.* is less than five areas, it is considered as localized demodicosis. This form of disease usually does not require any medication and heals spontaneously. However on the other hand, it is considered generalized demodicosis when there are 5 or more areas requires a long and careful treatment and is very life threatening. In cases where areas that are infected are only the legs and paws, it is considered demodectic pododermatitis and this condition is especially prone to breeds such as Old English sheepdogs. (Miller *et al.* 2013).

Based on the book by Miller *et al.* (2013), canine juvenile generalized demodicosis is considered to have hereditary basis. Within the first few days after birth, *demodex sp.* mites can be transmitted from the bitch to the nursing neonate in just 16 hours after birth. On the other hand, puppies delivered by cesarean section from bitch infected with *demodex sp.* do not harbor mites. The host that is responsible for the control of mite population in body is the immune system. The host’s immune system appears to detect and tolerate the presence of these mites and also has an inhibitory effect on mite proliferation and keeps mite numbers low without inducing any inflammatory response.

Over the years, a considerable amount of researches were done to identify the main immunological abnormalities in dogs with demodicosis. Many investigations were done over the years and it is difficult to conclude what are the key immunological defects in dogs with spontaneous generalized demodicosis. Most research was conducted in small groups of dogs of certain or different breed and age with different clinical manifestation therefore it is difficult to distinguish between immunological abnormalities that could be considered the trigger of *demodex sp.* overgrowth which leads to demodicosis (Ferrer *et al.* 2014). However there are a few investigations that indicated that dogs with generalized demodicosis suffer from an immune dysfunction called T-cell exhaustion. This process was defined as an antigen-specific effector T-cell dysfunction characterized by a stepwise progressive loss of T-cell function. T-cell exhaustion was documented in parasitic infections though previously was described initially in viral infections (Yi *et al.* 2010).

In many studies have stated that immune system plays a key role in the pathogenesis of canine demodicosis but the mechanisms that control mite population in healthy and diseased dogs remain far from being understood. Many authors agree that the immune response against *demodex sp.* mites is complex and involves both branches of host immune response: innate and adaptive response. Based on a journal by Ravera *et al.* (2015), the author had concluded that innate immune response is the first line of defense and a few studies suggested that chitin-bearing organisms could be modulate the innate immune response by increasing Toll-like receptor expression just
like as shown on the figure below (Figure 3). In this journal by the same author, it is discovered that there are presence of IgG antibodies directed against D.canis antigens in the blood serum of healthy dogs.

Figure 3 Control of Demodex sp. populations (Ferrer et al. 2014)

Abbreviations: EGF, epidermal growth factor; IL, interleukin; TGF-β, transforming growth factor-β; TLRs, Toll-like receptors.

Based on the figure 3, when there is an overgrowth of demodex sp., T-cell exhaustion occurs. In order to control the population of this mite, keratinocytes and Langerhans cells respond as acquired immune response while for innate immune response react from the recognition of chitin by keratinocyte TLRs.

Clinical Signs of Demodicosis

Localized demodicosis commonly occurs around the periocular area and the commissures of mouth. This variant of demodicosis shows clinical signs such as mild erythema and partial alopecia at one or several patch of skin. Several squamous patches can occur as well as pruritus. Localized demodicosis commonly occurs in young animals at the age of three to six months and heals spontaneously without treatment. To progress from localized to generalized demodicosis is very rare in true localized demodicosis. On the other hand, generalized demodicosis is marked as five and more infected area. This form of skin disease can be life threatening. It usually starts with several infected areas and with time, it does not improve and widespread (Miller et al. 2013). Hair follicles of generalized demodicosis expand due to large numbers of mite and secondary bacterial infections are common. This often results furunculosis where the follicles eventually rupture (Tilley and Smith 2007). According to Cerundolo (2016), clinical signs showed by dogs infected by demodex injai is an abnormal greasiness on the skin of the dorsal trunk and more common in terrier breeds.
### Diagnosis of Demodicosis

Skin scraping is the most commonly used test to detect the presence *demodex* sp. mites. This technique involves squeezing the affected skin area to extrude the mites from the deep follicles to the surface. Although the *demodex* sp. mite is a normal microflora on a dog’s skin, the results of skin scraping on healthy dogs should be negative.

Trichograms is an alternative way to deep skin scraping especially in areas that are difficult to scrape such as periocular and interdigital areas. Hairs from skin with lesion are plucked with forceps in the direction of the hair growth and placed in a drop of mineral or paraffin oil on a slide. Positive trichograms in healthy dogs are extremely rare in some cases when skin scraping and trichograms show a negative result, a skin biopsy will be needed to detect the *demodex* sp. mites in the hair follicles or in foreign body granulomas in furunculosis (Miller et al. 2013).

### Therapy of Demodicosis

In majority of dogs, localized demodicosis resolves spontaneously, thus mite-specific therapy is not necessary until the disease generalizes. Due to strong genetic basis, dogs with generalized demodicosis should not be used for breeding. In localized demodicosis, topical or systemic antibacterial therapy for the treatment of secondary bacterial infection may be initiated. On the other hand, dogs with generalized demodicosis majority have secondary bacterial folliculitis. To identify the presence of bacteria, cytological evaluation is needed to differentiate cocci and rods (Miller et al. 2013). According to the same authors, the most common bacterium isolated is *Staphylococcus* spp. and the most common gram-negative bacteria found in canine demodicosis are *Pseudomonas aeruginosa* or *Proteus mirabilis*. In demodectic pododermatitis, *Pseudomonas aeruginosa* causes severe pyogenic. A bacterial culture should be performed to determine the choice of antibiotic.

Amitraz and Macrocyclic lactones (Ivermectin) are known for their effectiveness in the treatment of demodicosis in dogs (Janczak et al. 2017). Amitraz is used as dips to treat demodicosis and also other various externa parasites in other species such as cattle, rabbits, goats and cat. The oral lethal dose of amitraz for dogs is 250 mg/kg and the most common signs of toxicity is sedation, bradycardia and ataxia (Richardson 2013). It is important to clip the hair coat in dogs with medium to long hair coat when using amitraz rinses and the rinse should be applied carefully with sponge and air dry without rinsing. Between rinses, dogs should not be allowed to get wet to avoid washing off the amitraz (Miller et al. 2013). According to Tilley and Smith (2007), this medication should be used weekly until resolution of clinical signs and negative skin scrape. Continue the treatment for a month following negative skin scrape. The efficacy is proportional to the frequency of the treatment as well as the concentration of the dip. In case of toxicity, Yohimbine and Atipamezole can be used as antidote (Richardson 2013).

When therapies fail to show positive impact in the recovering on a dog, there are a few alternative treatments available to boost the immune system. Various other
treatments for generalized demodicosis such as Vitamin E, lufenuron, levamisole and homeopathic preparations have been reported in the literature but there is no good evidence to recommend their use and in fact for some of these drugs there is good evidence not to use them (Mueller 2004).

**METHODOLOGY**

**Time and Place**

This study case is done in the practical vet clinic of Drh Setyo Widodo DKK, that is located at Jalan Pandu raya 173, Tegal Gundil Bogor 16153.

**Materials and Method**

This study case research was conducted using secondary data of dogs in the vet clinic of Dr. Setyo Widodo DKK. The data obtained from medical records of patients were then evaluated and analyzed descriptively. Cases taken were in the time frame of January 2015 to March 2017. There are a total of 22 cases of dogs with positive demodicosis.

**RESULTS & DISCUSSION**

Based on the data taken from year 2015 until 2017 from clinic of Dr. Setyo Widodo DKK, there were 22 dogs which were found with clinical signs of *demodex sp.* infection. There were 13 cases in 2015, 8 cases in 2016 and 1 case until the March of 2017. Out of these 22 cases, 17 of the dogs, which is 77.3% were males and the rest 22.7% were females as can be seen on the table below (Table 1).

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<th>Dog Number – N</th>
<th>Sex</th>
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Table 1 Sex and breeds of 22 dogs with demodicosis in clinic of Dr. Setyo Widodo DKK
Based on the date obtained, it can be seen that males are more susceptible to this skin disease when compared to females. According Miller WH et al. (2013), the predisposing factor of a dog towards this skin disease varies from age, short hair, poor nutrition, estrus, parturition, stress, endoparasites and debilitating disease. However, factors such as size, activity of sebaceous glands and sex of the animal have no effect on the development or progression of demodicosis. As a matter in fact, these same authors concluded that purebreed dogs with good diets and generally good condition are more prone to this skin disease. There are a few breeds that are highly susceptible to demodicosis were American Staffordshire terrier, Shar-pei, Scottish terrier, English bulldog, Boston terrier, Great Dane, Weimaraner, Airedale terrier, Alaskan malamute, Afghan hound and Shih Tzu. Based on the data in table 1, it can be observed that the mixed-breed dogs and Siberian Husky are the two most susceptible to demodicosis.

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<th>Dog Number – N</th>
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Total: 17 5 3 1 1 4 1 1 4 3 1

Percentage (%): 77.3 22.7 13.6 4.5 4.5 18.2 4.5 4.5 18.2 13.6 4.5

Notes: C.C = Chow Chow  P.B = Pitbull
G.P = German Shepherd  M.B = Mixed Breed
D.M = Doberman  S.T = Shih Tzu
S.H = Siberian Husky

Based on the date obtained, it can be seen that males are more susceptible to this skin disease when compared to females. According Miller WH et al. (2013), the predisposing factor of a dog towards this skin disease varies from age, short hair, poor nutrition, estrus, parturition, stress, endoparasites and debilitating disease. However, factors such as size, activity of sebaceous glands and sex of the animal have no effect on the development or progression of demodicosis. As a matter in fact, these same authors concluded that purebreed dogs with good diets and generally good condition are more prone to this skin disease. There are a few breeds that are highly susceptible to demodicosis were American Staffordshire terrier, Shar-pei, Scottish terrier, English bulldog, Boston terrier, Great Dane, Weimaraner, Airedale terrier, Alaskan malamute, Afghan hound and Shih Tzu. Based on the data in table 1, it can be observed that the mixed-breed dogs and Siberian Husky are the two most susceptible to demodicosis.
A total data of 22 dogs confirmed with demodicosis was obtained from Dr. Setyo Widodo’s vet clinic. Total of 68.2% of the dogs were diagnosed with *demodex* sp. infection through skin scraping technique while the rest 31.8% were diagnosed through anamnese as well as clinical signs. If the result of skin scraping comes back a negative, there are some alternative technique such as trichograms and skin biopsy. Out of quite a number of clinical signs, pruritus, erythema and alopecia were the three most occurred signs which is pruritus for 68.2%, erythema for 40.9% and alopecia for 36.4% respectively. There were other clinical symptoms such as hyperpigmentation on skin, edema, urticarial, myiasis, pus and scaly skin. Variations in clinical signs can be seen in table 2 below.

**Table 2**  Clinical signs of 22 dogs with demodicosis in clinic of Dr. Setyo Widodo DKK

<table>
<thead>
<tr>
<th>Dog number</th>
<th>Alopecia</th>
<th>Hyperpigmentation</th>
<th>Oedema</th>
<th>Pus</th>
<th>Pruritus</th>
<th>Urtikaria</th>
<th>Erythema</th>
<th>Myiasis</th>
<th>Scaly skin</th>
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Total 8 3 2 2 15 1 9 1 3

Percentage (%) 36.4 13.6 9.1 9.1 68.2 4.5 40.9 4.5 13.6
Pruritus is defined as the sensation and desire to scratch, rub, chew or lick as an indicator of inflamed skin (Tilley and Smith 2007). This condition in this study was resulted by mites proliferating under the cutaneous layer causing a high level of itchiness and discomfort therefore leading to erythema (40.9%) because the animals tend to scratch at the itchy areas. Alopecia is usually caused by pruritus due to self-induced trauma. It is characterized by partial or complete hair loss in areas where hair is normally present (Tilley and Smith 2007). Alopecia can also be caused by an organ-specific T cell-mediated autoimmune disease that targets anagen-stage hair follicles. This disease severity subtypes range from one or more local patches of hair loss to total loss of hair. In dogs with demodicosis, alopecia occurs due to mites living in hair follicles and damaging them causing the autoimmune system in the skin responds to the invasion of *demodex sp.* mites. In some cases of alopecia, antibiotic and antipruritic was needed prior to *demodex sp.* therapy. Dog case number 4 and 5 showed no clinical signs and demodicosis was diagnosed with skin scraping technique.

In some cases of canine demodicosis, dogs with clinical sign of alopecia sometimes come with hyperpigmentation as well. In this study, a total of 13.6% of dogs suffer from hyperpigmentation. Hyperpigmentation or also known as melanoderma is defined by an increased melanin in epidermis and corneocytes. This condition causes the color of skin to darken at certain areas or overall. It is usually caused by genetic, acquired factors, or related to pigmented tumors. Based on the observation of Miller et al. (2013), dogs with adult-onset demodicosis usually has disorders such as hypothyroidism, hypercortisolism, leishmaniasis and etc. Therefore, it is safe to say in this case study, hyperpigmentation is caused by hormonal factors. On the other hand, another factor of hyperpigmentation is alopecia. When alopecia occurs at certain parts of the body, hair or fur from that particular area falls off and therefore exposing the skin to direct contact with light (UV ray). This plays a big contribution to pigmentation changes on the skin.

In this case study, it can be observed from the table above (table 2) that scaly skin occurs in 13.6% of dogs. Scaly skin is also known as keratinization. Keratinization defects are defined the alteration in appearance of the surface of skin. When *demodex sp.* proliferates in the hair follicles, it disrupts the balance between cell death and cell renewal. The epidermis of animals will contantly produce new cells and cause a thickening on skin (Miller et al. 2013). A new technique that is less traumatic than skin scraping was introduced by Pereira in an article by Mueller and Shipstone (2017). This new technique involves the use of an acetate tape. Around 10 cm of acetate sticky tape was placed on the skin and that area was squeezed for 4-5 seconds. The tape was then removed and placed on a glass slide for observation under a light microscope. It was said that the sensitivity of this technique is the same as skin scraping.
Table 3 Therapy on 22 dogs with demodicosis in clinic of Dr. Setyo Widodo DKK

<table>
<thead>
<tr>
<th>Therapy</th>
<th>Ivermectin Pro-potent</th>
<th>Amitraz Shampoo</th>
<th>Pyohex Shampoo</th>
<th>Methyl prednisone</th>
<th>Zinc Oxide (cream)</th>
<th>Rivanol</th>
<th>Erythromycin</th>
<th>Ery-Sanbe</th>
<th>Cefadroxil</th>
<th>Claneksi</th>
<th>Chloram Fecort</th>
<th>Aler-dex</th>
<th>De-matrix</th>
<th>Shave bald</th>
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| Total            | 16                     | 2                | 1              | 1                 | 1                  | 1       | 9            | 1         | 1          | 1        | 1             | 1        | 4         | 1          |

Number of dog with no improvement: 11

Percentage: 72.7% improved, 22.7% consedent, 9.1% no improvement.
In this study case, there were 15 types of therapies that were practiced on the 22 cases of dogs infected by demodicosis. The most used therapies were Ivermectin, it was used for 72.7% of the cases, Erythromycin was 40.9% and Promectin for 22.7%. In many studies, Ivermectin has been proven to be an effective pesticide for mites on various animals though the usage of this drug must be careful on young animals.

In the previous page is the table (table 3) of therapy done by 22 dogs in this study. A total of 40.9% of the dogs used Erythromycin as antibiotic. Erythromycin is the one of the oldest and best-known antibiotic agent in the class of macrolides. This macrolide antibiotics slow the growth and sometimes kill sensitive bacteria by reducing the production of important proteins needed by bacteria to survive (Muntum 2017). When a dog is infected by *demodex* sp., a secondary bacteria frequently occurs therefore erythromycin was widely used as an antibiotic.

A total usage of 72.7% of Ivermectin and 22.7% of Promectin were used as pesticides for *demodex* sp. Ivermectin is an averamectin anthelmintic and it enhances the release of gamma-aminobutyric acid (GABA) at presynaptic neurons, causing paralysis of parasites and eventual death (Plumb 2011). Ivermectin should not be used on Collies or herding breeds such as Shetland Sheepdogs, Old English Sheepdogs, Australian Shepherds as well as dogs with ‘white feet’. These breeds have low level of P-glycoprotein which is in charge of the absorption, distribution, metabolism and excretion of a variety of drugs. Due to a gene defect ABCB1Δ, formerly known as MDR1 in the dogs, Ivermectine can cause neurotoxicity at demodicosis dose to the dogs breeds stated above. However, it is considered safe to use this drugs on these sensitive animals if Ivermectin is given as the dosage of heartworm prophylaxis. Overdosage of Ivermectin develops within 4 hours in sensitive breeds and activated charcoals are recommended to use repeatedly to interrupt enterohepatic recirculation. Ivermectin can cause several effects such as lethargy, tremors, mydriasis and ataxia up to coma and death in certain sensitive individuals (Plumb 2011). Based on book by Peterson and Talcott (2013), most dogs tolerate oral ivermectic dosages up to 2.5 mg/kg meanwhile for sensitive breeds, they can only tolerate doses up to 0.1 mg/kg before showing clinical signs of toxicity.

In many studies have stated that Amitraz is one of the best therapy for demodicosis. This therapy involved diluting Amitraz in water and use as a dip or shampoo for dogs. However in this study case, only 2 dogs used this form of therapy. Dog case number 15 had a rare case of myasis where maggots were found on the skin lesion of the dog. The technique used for this case was to shave the animal bald, and zinc oxide cream to decrease the skin irritation. A study done by Wright (2014) stated that Amitraz is not suitable and contraindicates with Chihuahuas.

A recent journal by Samal *et al.* (2017) stated that generalized juvenile demodicosis was successfully treated with oral immune-modulator (Immune plus) that contains colostrum, vitamin C, Zinc Sulphate, Vitamin A and other essential vitamins. This was used orally for a period of 15 days, 1.5ml thrice daily. Other than that, herbal ectoparasite control lotion/oil (Zerokeet) that is composed by all herbal ingredient was used topically. Together with the combination of oral antibiotic, it was reported to have successfully cured the puppy with generalized juvenile demodicosis.
In a research study, it was proved that Bravecto™ (fluralaner 14.64% w/w) chewable tablets is very effective for generalized demodicosis. Mite numbers in skin scraping reduced by 99.8% on day 28 and increase to 100% on day 56 and 84. While on the other hand, Advocate® (imidacloprid 10%, moxidectin 2.5%) was used topically and mites were found reduced by 98.0% on day 28. By 12th week after the initial treatment, both treatments resulted a reduction skin lesions and increase hair growth (Fourie et al. 2015).

CONCLUSION

Based on the data obtained from a vet practice, 22 dogs with demodicosis were treated. From the data obtained it was shown that the clinical signs that appear the most is pruritus (68.2%) on varies parts of their bodies and 40.9% of the dogs suffered from erythema as well as scaly skin and alopecia at 13.6% both. The therapy that was most commonly used in this study case on 22 dogs were Ivermectin (72.7%), Erytromicin (40.9%) and Promectin (22.7%).

SUGGESTION

New born from a bitch with demodicosis should be separated to avoid transmission of this disease. Early diagnosis on adult-onset cases is vital for a better prognosis and chance of recovery.

REFERENCES


Mulfum C. 2017. Erythromycin. [Internet]. [Viewed on 10th August 2017]. Available at: https://www.drugs.com/erythromycin.html


BIOGRAPHY

The writer of this case study is Foo Fei May who was born in Johor, Malaysia on the 30th of January 1994. She was the youngest child among 4 of Foo See Hiang and Wong Lee Ang. She went to SK Holy Jesus Convent in Johor Bahru during primary school and continued her high school years in SMK Mutiara Rini in Johor Bahru. Later on after high school she attended TMC College, taking the course of Foundation in Science for 8 months in Cheras, Kuala Lumpur. In the August of 2012, she took an entrance exam in order to enroll herself as a student in Faculty of Veterinary Medicine, at Bogor Agricultural University, Indonesia.

During high school the writer was very involved in music and extracurricular activities. The writer plays piano to grade 7 ABRSM and violin to grade 5 ABRSM and was a part of Band Society as a vocalist. In the year 2010, she was the Secretary of Saint John Ambulance society and in the same year 2010 until 2011, she was the vice president of the Band Society. The writer took her parents by great surprise in making the decision to pursue a career in the veterinary medicine field. While in Malaysia, writer was very active as a volunteer at local animal shelters and spent quite a lot of time during weekends to join events such as Showering Events, Hair Cut days and etc. Throughout the years studying in Bogor Agricultural University, she was involved in Badminton Club of IPB. For Olive 2015, she earned a gold medal in badminton, women’s double.