MITE AGENT DEMODICOSIS

MEDICAL BIOLOGY

By Shahzad Kareekunnan

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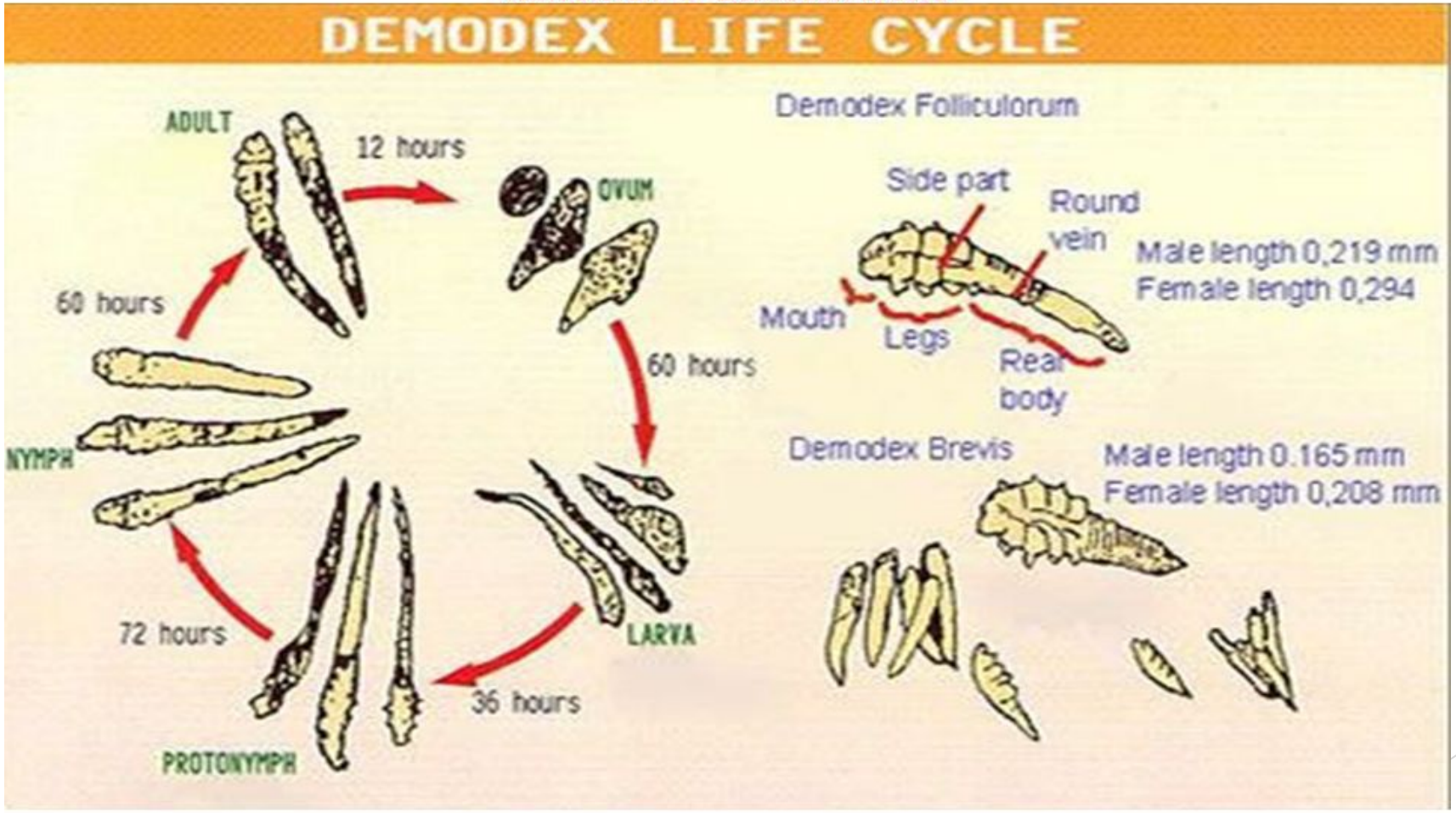
Introduction to Demodicosis

- Canine demodicosis is one of the well known skin diseases encountered in veterinary practice. It is a dermatologic disease that occurs when mites colonize the hair follicles, sebaceous glands. Dermatological changes include erythema, alopecia, comedones, follicular hyperkeratosis, pustules, crusts and seborrhea. Often, a secondary pyoderma further complicates the disease (Scott et al. 2001). *Demodex canis* was the main causative agent of canine demodicosis and it is characterized by the presence of large numbers of *Demodex* mites. The three recognized canine *Demodex* mites are: *Demodex canis*, *Demodexinjai*, and the unnamed short-bodied mite. *Demodex canis*was the first to be identified and named the two additional *Demodex* mites may be mutations of *Demodex canis*, or separate species.

It is grouped as

Arthropoda/Chelicerata/Arachnida/Acarina/Demodicidae/Demodex/Demodex folliculorum or *Demodex brevis*



Modes of transmission

- Infection of humans by mite occurs mainly by direct contact between humens. It is believed that during the daytime mites are mainly in the follicles, and the skin surface only come at night. It follows that the most probable time of transition from one host ticks on the other - the night.
- Infection through household items, as it was shown that the mites can long enough to remain viable outside the host.

The role of mites Demodex in the development of skin diseases

- Parasite on human these mites can often be asymptomatic.

Carriers of mites are on average up to 55% of people.

With age, the mite infestation increases and, according to some authors, the elderly up to 100%.

Because of this, their role in the development of skin diseases remains a controversial issue, but it has been proven that an important factor is the number of D. folliculorum mite more than 5 copies per sq cm/

Number of mites significantly increased in patients with certain forms of rosacea: apparently genus Demodex mites are involved in the pathogenesis of these diseases/

Epidemiology

- Common among people of all races. Person's gender does not affect the frequency of tick infestation, just men rarely go to the doctor about ther appearance. With age, the detection rate increases D. brevis and D. folliculorum - remains virtually unchanged. In humans demodicosis often accompanies other skin or ophthalmic diseases such as rosacea, perioral dermatitis, blepharitis. However, it should again be emphasized that demodicosis is associated primarily with the defeat of the skin of the face.

Clinical features

- **Favourite localization of mites:**
- **- eyelinds;**
- **- facial skin;**
- **- browridges; -**
- **forehead; -**
- **Nasolabial folds;**
- **- Chin; -**
- **The outer ear canal.**

Biology and ecology of ***mites*** (ticks)

- Demodex follikulorum the most common, found only in human hair follicles, sebaceous glands, the outside of the host (human) reproduction of the mite stops.
- Mite is viable outside the host if saved with constant humidity and average temperature in the dark for up to 9 days.
- The optimum temperature for development of the mite - 30-40 ° C at 14 ° C mites are in a state of torpor and at 52 ° C is rapidly die. In the water stored insects to 25 days in dry air are killed 1.5 days. The most favorable breeding ground for demodex - vegetable oil, grease, petroleum jelly.

Signs and symptoms

- Minor cases of demodectic mange usually do not cause much itching but might cause pustules, redness, scaling, leathery skin, hair loss, skin that is warm to the touch, or any combination of these. It most commonly appears first on the face, around the eyes, or at the corners of the mouth, and on the forelimbs and paws. It may be misdiagnosed as a "hot spot" or other skin ailment.
- In the more severe form, hair loss can occur in patches all over the body and might be accompanied by crusting, pain, enlarged lymph nodes, and deep skin infections.

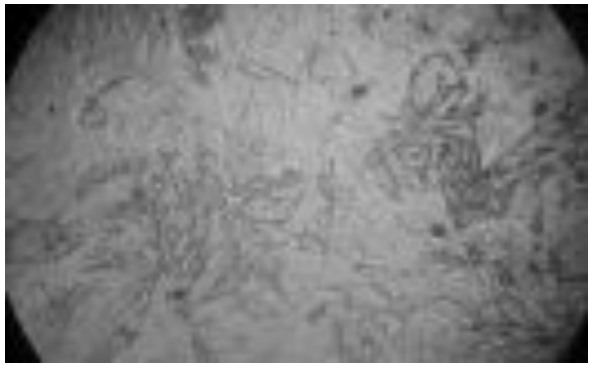
Materials and methods

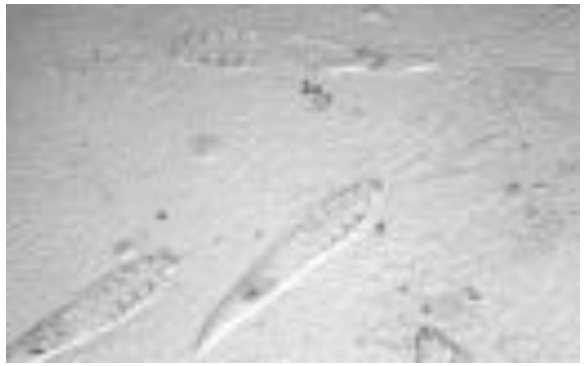
- Two mongrel dogs aged between 7 and 9 months belongs to a same house was brought to the Veterinary Hospital, Proddatur with a history of skin lesions associated with pruritus from One month. Upon clinical examination, dogs exhibited papules, pustules, erythema, alopecia, hyperpigmentation, erosions, lichenification and cellulitis. Distribution of lesions observed on face, around the eyes and ears, chin region, fore limbs, neck and lateral abdomen (Fig. 1). Skin scrapings, tape impression smears and hair plucks was collected from the affected dogs for laboratory examination. Scrapings were collected with scalpel blade dipped in liquid paraffin and collection of scrapings was continued until there was slight ooze of blood from dermal capillaries

- Material was suspended in a few drops of liquid paraffin on a microscopic slide, a coverslip was applied and the preparation was examined under low and high power (10X, 40X) of microscope. The acetate tape impression smears was used to investigate superficial mites. The sticky surface of the tape was pressed on the suspected lesions, and tape was then mounted directly on a glass slide. The glass slides were examined under compound microscopes with 10X and 40X of magnification. Few tape impression smears were stained with new methylene blue for 1 min and examined under 100X (Rosenkrantz 2008).

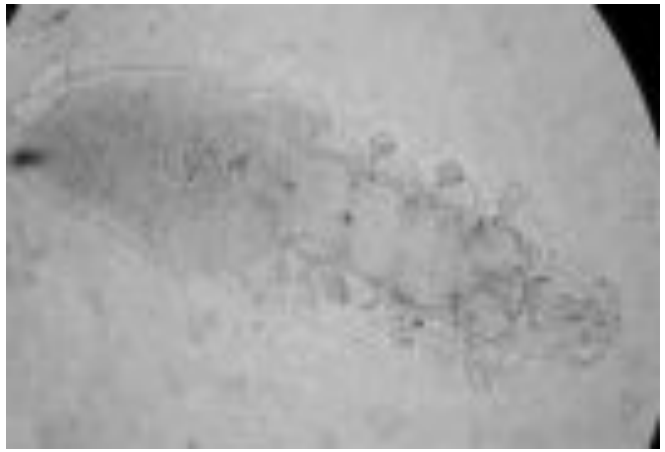
Results and discussion

- Skin scrapings collected from the head region, revealed different stages of *Demodex*mites (Fig. 2) along with few ovigerous female mites (Fig. 4a). *D. canis* were found in hair pluck examination technique. The tape impression technique of the dogs revealed more number of short-tail *Demodex*mites (*D. cornei*). Cytology of impression smears revealed cocci, cocci engulfed by neutrophils which indicate involvement of secondary bacterial infection.
- Based on the history, lesions and laboratory findings, the present case was diagnosed as generalized superficial demodicosis of *D. cornei* and generalized follicular demodicosis of *D. canis* with secondary bacterial pyoderma. Dogs were treated with oral ivermectin at 500 µg/kg/day for 45 days by regular monitoring for the side effects.
- Ampicillin at 25 mg/kg twice a day orally, BID for 14 days was given to control secondary bacterial infection. After one week of antibiotic therapy, amitraz (2 ml in 1 litre of water) was given weekly twice as topical application followed by bath with benzyl peroxide (petben) shampoo up to the recovery period.
- One week after therapy moist lesions and scales was disappeared and dogs had mild pruritus. 2 weeks after treatment, the number of surface *Demodex*mites detected by the tape preparation technique was gradually decreased and the dogs were free from pruritus, erythema, erosions, and ulcers. One month after treatment, the general skin condition was improved; absence of pruritus was noticed and number of surface *Demodex* mites was also decreased. Complete disappearance of mites and re-growth of hair was noticed after 45 days of after therapy.





- Mites with short tail were identified as *D. cornei* based on other morphological characteristics. Mites present in the tape impression smears had elongated body with short stumpy legs on podosoma and shorter opisthosoma. The measurements were carried out on the gnathosoma length, podosoma length, opisthosoma length and total body length. The adult mites were measured in microns by using ocular and stage micrometers under compound microscope. Measurement data of twenty-six adult (males and females) *D. cornei* mites of this study were reported. Twenty-six mounted adults of *D.*



Facts

- It’s the myth that demodex is the cause of the appearance of acne.
- Demodex can live on healthy skin with out causing acne. Moreover, demodex is found on the healthy skin of most people, especially on oily skin.
- And only under certain favorable conditions for the development of the demodex mite leads to the formation of acne and the development of demodicosis.

Conclusion

- The short tailed *Demodex* mites collected from the two dermatitis dogs in this study were *D. cornei*. They had short opisthosoma and blunted posterior end when compared with *D. canis*. The mean total body length of short form of *Demodex* spp. was 132.21 microns while the mean total body length of *D. canis* was 214.32 microns.

THANK YOU

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