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Platelet-Rich Plasma (PRP) Therapy in Canine Alopecia

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Abstract

The present study was conducted to evaluate the therapeutic efficacy of platelet-rich plasma (PRP) as an adjunct to conventional management in dogs affected with alopecia and to assess the utility of trichogram analysis as a diagnostic and therapeutic monitoring tool. A total of 20 client owned dogs presented with alopecia were divided into two treatment groups and compared with ten healthy controls. Dogs in group I received conventional therapy, while Group II received conventional therapy along with PRP administration once weekly for two consecutive weeks. Haematology, serum biochemistry, and trichogram analysis were performed before and after therapy. Pre-treatment trichogram analysis revealed predominance of telogen hairs along with follicular casts, trichoptilosis, distorted hair shafts, and pigmentary abnormalities, indicating follicular inactivity and impaired hair growth. Post-therapeutic evaluation demonstrated significant clinical improvement in PRP-treated dogs, characterized by earlier hair regrowth, improved coat quality, increased hair density, and a higher proportion of anagen hairs compared to dogs receiving conventional therapy alone. The average recovery time and percentage recovery were superior in the PRP-treated group (9 days and 97%, respectively) compared to the conventional therapy group (17 days and 74%, respectively).

Keywords: PRP, Canine alopecia, Trichogram

Introduction

Alopecia is a common dermatological disorder in dogs characterized by partial or complete loss of hair that occurs due to inflammatory or non-inflammatory aetiologies. Non inflammatory alopecia primarily results from hair cycle arrest and also inadequate production of new hair with diverse causes, making accurate diagnosis essential for successful management. Among the various diagnostic modalities used for dermatological examination, trichography stands out as a valuable, noninvasive diagnostic tool for assessing hair shaft abnormalities, follicular activity and hair growth cycles in the diagnosis of canine alopecia. In recent years, Platelet Rich Plasma (PRP) therapy is emerging as a promising regenerative therapy in human as well as Veterinary practice. The present study documents the efficacy of PRP in alopecic dogs and to assess trichogram findings as indicators of therapeutic response.

Materials and Methods

The present study was conducted on client owned dogs presented to Teaching Veterinary Clinical Complex, NTR College of Veterinary Science, Gannavaram with signs of alopecia were screened for inclusion in the study. A detailed clinical evaluation, skin scrapings examination, flea comb test, skin cytology, diet exclusion trials were carried out to determine the etiology. The selected cases were subjected to trichographic examination for assessment of hair shaft morphology, follicular activity, and hair growth cycle abnormalities. Hematological and biochemical investigations were performed to rule out underlying systemic disorders associated with alopecia. A total of 20 dogs were selected for the study and were randomly divided into two groups. Group I (n = 10) received conventional therapy comprising antiparasitic treatment, nutritional support and supportive care. Group II (n = 10) was treated with conventional therapy with platelet-rich plasma (PRP) therapy, administered once weekly for two consecutive weeks. Group III i.e., healthy control group (n = 10) consisted of clinically normal dogs used for establishment of reference values. Platelet rich plasma was prepared using standardized double centrifugation technique under aseptic conditions. Five to ten millilitres of venous blood was collected aseptically into sodium citrate anticoagulant (9:1 ratio). The sample was subjected to two-step centrifugation process: a soft spin @1000 rpm for 10 minutes (Fig. 1) followed by a hard spin @1600 rpm for 10 minutes (Fig 2) which yields platelet poor plasma (PPP) and platelet rich plasma (PRP). Trichogram analysis was performed before and after therapy to determine the percentage of anagen, catagen, and telogen hairs along with hair shaft

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abnormalities. Therapeutic response was assessed based on clinical improvement, extent of hair regrowth, and changes observed in trichogram findings during the post-treatment period.

Figure 1: First centrifugation

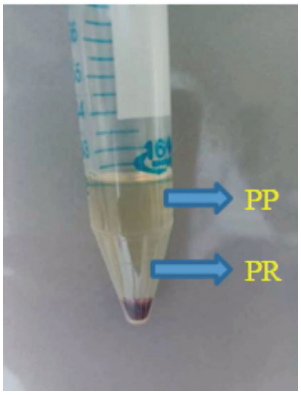


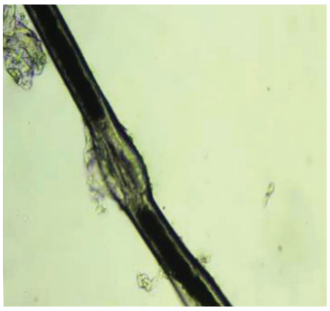
Figure 2: Second centrifugation

Results and Discussion

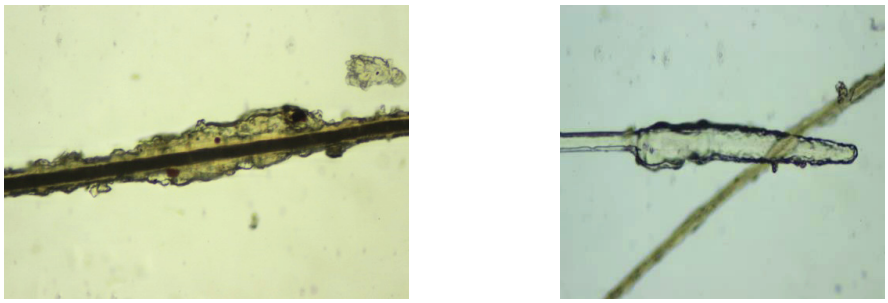
Haematological and serum biochemical parameters showed no significant alterations in in either of the therapeutic groups when compared with the control group dogs, indicating the absence of major systemic metabolic disturbances associated with the condition. Trichogram analysis of dogs affected with non-inflammatory alopecia prior to initiation of therapy revealed a predominance of telogen phase hairs, suggestive of hair cycle arrest and reduced follicular activity. In addition, several microscopic abnormalities including follicular casts, trichoptilosis, distorted hair shafts, and irregular hair pigmentation were observed. These findings were indicative of impaired follicular health and possible nutritional or metabolic deficiencies. In certain cases, trichographic examination also revealed features suggestive of demodicosis, characterized by perifollicular debris and structural damage to hair shafts (Fig 3and 4).

Post-therapeutic evaluation demonstrated marked improvement in trichographic parameters, particularly in dogs treated with Platelet-Rich Plasma (PRP) therapy showing higher percentage of anagen phase compared to conventional treatment. A progressive increase in the proportion of anagen phase hairs along with a corresponding reduction in telogen hairs was recorded during the follow-up period in animals treated with PRP (Fig.5). The average time taken and percentage of dogs recovered in group I was 17 days and 74 % respectively while in group II the same was recorded as 9 days and 97 per cent reflecting a superior response with PRP. The reappearance of healthy anagen hairs reflected reactivation of dormant hair follicles and restoration of normal follicular cycling. Furthermore, reduction in follicular casts, improvement in hair shaft integrity, and increased hair density were observed in successfully treated cases. Clinically, these changes were associated with visible hair regrowth, improved coat quality, and reduction in the extent of alopecic lesions. The observed shift in hair cycle dynamics suggested a favourable therapeutic response and highlighted the regenerative potential of PRP in the management of canine non-inflammatory alopecia.

Trichoptilosis



Hair shaft abnormality



Follicular casts **Telogen phase**

Fig. 3 Pretherapy trichogram analysis in dogs with non-inflammatory alopecia

Pretreatment **Post treatment**

Fig. 4. Pretherapy and Post therapeutic comparison of skin lesions in dogs treated with PRP

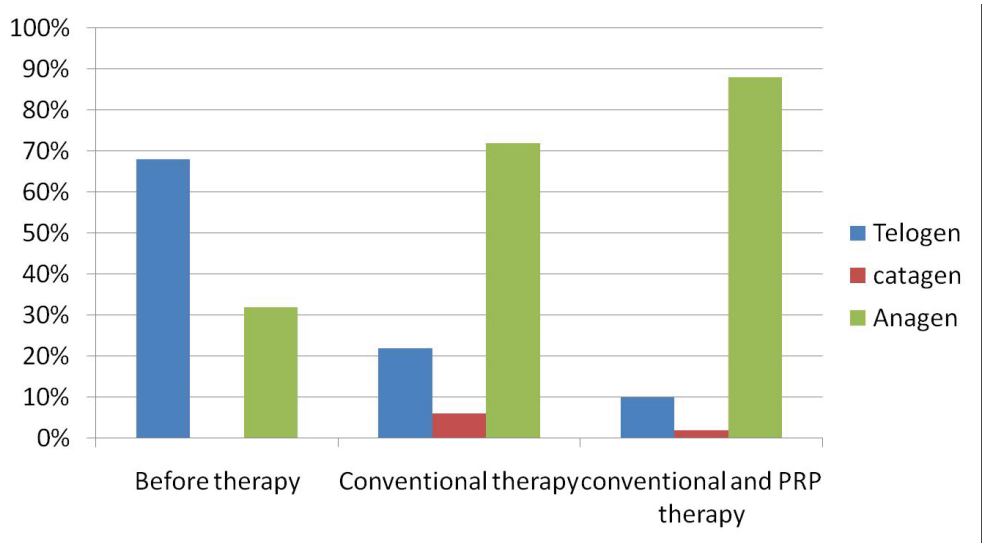


Fig. 5.Trichogram analysis

PRP-derived growth factors may enhance dermal papilla cell activity, increase perifollicular vascular supply, reduce follicular apoptosis, and prolong the anagen phase (Manole et al., 2023). The present findings are in agreement with the regenerative principles described by **Foster *et al*. (2009),** who emphasized the clinical potential of PRP in tissue healing. Similarly, **Marx (2004)** and **Anitua *et al*. (2004)** documented the reparative and regenerative potential of PRP in medical applications. In veterinary medicine, **Jee *et al.* (2016)** demonstrated beneficial effects of autologous PRP on cutaneous wound healing in dogs, supporting the broader dermatological applications of PRP. Future studies should therefore include larger cohorts, standardized clinical scoring systems, objective trichographic quantification, histopathological correlation, and longer follow-up periods to better evaluate the durability of hair regrowth and recurrence rates.

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