

Veterinary: Feline Patient Treated with Transdermal Gabapentin

SUMMARY: Sam is a feline patient who suffered a road traffic accident and, as a result, was taking oral gabapentin to manage his fits. In order to ease administration and increase treatment compliance, Sam was prescribed gabapentin transdermal (PCCA Formula #13452). Sam's quality of life increased considerably following the alternative treatment, namely regarding his mental/emotional and social functioning dimensions.

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Case Report:

Sam (Figure 1) is a cat who was first admitted at the veterinary practice *Village Vet* following a stray road traffic accident, at the age of approximately 5 months. He was completely blind then but regained his sight over the years. Following three unconscious fits, a CT scan was performed on Sam and a fracture at the base of his skull was identified, which resulted in a chiari malformation. In order to manage his fits, the veterinary prescribed gabapentin 10 mg tablets, three times a day, which were administered for 6 months (January-June 2017). Although the medication was well tolerated, it was difficult for the caregivers to administer the tablets. An alternative oral liquid was then prescribed but it was also difficult to administer the oral liquid, perhaps due to the roast chicken flavor that Sam disliked very much. This medication was administered for over 1 year. Following the advice of a compounding pharmacist, the veterinary prescribed a third alternative formula: gabapentin transdermal 10 mg/0.1 mL (Table 1), in a dosing of 0.25 mL to be applied three times a day on the inside of Sam's ear. The compounded medication was dispensed in a Topi-Click® Micro™ pen (Figure 2), which delivers 0.05 mL/click. As such, five clicks were necessary at each topical application.

Rx	10 mL
Gabapentin USP	0.5 g
Purified Water, USP	1 mL
Base, PCCA Lipoderm®	q.s. 10 mL

Table 1. PCCA Formula #13452: Gabapentin 10 mg/0.1 mL Topical Lipoderm (Veterinary).



Figure 1. Feline patient named Sam; photo shared by the registered veterinary nurse in charge.

Methodology:

The efficacy of the transdermal treatment was assessed using a generic, validated health-related quality of life (HRQoL) instrument, specially designed for feline patients – the Cat HEalth and Wellbeing (CHEW) questionnaire. It is an observer-reported assessment of the cats' HRQoL based on the owner's perception of the overall health and wellbeing of cats. This questionnaire includes 33 items distributed in three dimensions and eight domains, as follows: physical dimension (mobility, eyes, coat, fitness and appetite domains); mental/emotional dimensions (emotions and energy domains); and social functioning dimension (engagement domains). It is therefore a multidimensional instrument that encompasses both active and inactive activities. Rating is obtained using a 6-point Likert scale, where 1 = never and 6 = always, plus a 'does not apply to me and my cat' option for each item. Scoring is then computed per overall domain using a 0-100 metric [1].

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Figure 2. Topi-Click Micro with rounded applicator (PCCA item #35-5610).

Written permission was obtained to use the CHEW questionnaire as a research instrument to evaluate the efficacy of a transdermal compounded medication on this feline patient in particular.

Results and Discussion:

The CHEW questionnaire was completed before treatment, in September 2018, and following 3 months of transdermal treatment (instead of the last 7 days, as stated in the questionnaire).

Of the eight domains evaluated, four domains remained unchanged (mobility, coat, fitness and appetite), whereas the other four domains indicated considerable improvements in the Sam's HRQoL. The highest improvements were observed in the engagement domain (61%), in which questions such as 'My cat was curious about his/her surroundings' were all rated '6 = always,' following 3 months of transdermal treatment. The emotions domain improved by 33% whereas the eyes and energy domains improved by 15% and 12%, respectively. These four domains are part of the three dimensions evaluated by the CHEW questionnaire. However, the mental/emotional and social functioning dimensions were the ones with the highest improvements in the Sam's HRQoL. These results are in accordance with the registered veterinary nurse in charge of this patient who stated:

"Sam is so much happier now; he was so unhappy with the tablets and liquid, I have my old happy boy back!" Also, according to the same nurse, Sam had only one petite mal and one grand mal seizure since the start of the transdermal treatment, as opposed to grand mal seizures once a month when he was taking the gabapentin 10 mg tablets.

Conclusions:

Feline road traffic accidents are a common cause of mortality and significant injury, particularly to the extremities, head and neck of cats. Younger, male and crossbred cats have great odds of being injured in these accidents [2], just like Sam – the veterinary patient evaluated in this case study.

Gabapentin transdermal compounded medication was prescribed to Sam as an alternative to the corresponding tablets and oral liquid, in order to ease administration and increase compliance. The transdermal delivery is a non-invasive route of administration that allows for the percutaneous absorption of drugs, which are absorbed directly into the systemic circulation over a period of time, bypassing the first-pass metabolism [3]. According to the observer-reported outcomes (ORO) by the CHEW questionnaire, the quality of life of Sam increased considerably following the transdermal treatment, namely regarding his mental/emotional and social functioning dimensions.

References:

1. Freeman, L.M., Rodenberg, C., Narayanan, A., Olding, J., Gooding, M.A. and Koochaki, P.E. (2016) 'Development and initial validation of the Cat Health and Wellbeing (CHEW) questionnaire: a generic health-related quality of life instrument for cats', *Journal of Feline Medicine and Surgery*, 18, p. 689-701.
2. Conroy, M., O'Neill, D., Boag, A., Church, D. and Brodbelt, D. (2019) 'Epidemiology of road traffic accidents in cats attending emergency-care practices in the UK', *Journal of Small Animal Practice*, 60 (3), p. 146-152.
3. Bassani, A.S., Banov, D., Simmons, C. and Phan, H (2015) 'In vitro characterization of the percutaneous absorption of tramadol into inner ear domestic feline skin using the Franz skin finite dose model', *Veterinary Medicine and Animal Sciences*, 3 (3), doi: 10.7243/2054-3425-3-3.