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The veterinary practice's role in ensuring compliance to a treatment plan for dogs with insulin-deficient diabetes

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ABSTRACT: This questionnaire-based study aimed to investigate the relationship between the level of compliance to treatment plans and the communication between the owners of diabetic dogs and veterinary staff.

The results revealed that the frequency of communication did not affect the compliance score. Of the six factors analysed, one influenced compliance and four influenced the frequency of communication.

The study concluded that financial constraints and poor education are contributing factors to the underutilisation of veterinary services. The requirement for practices to improve client education was exposed as a crucial step to improving patient care in dogs.

Keywords: diabetes; compliance; communication; owner

Introduction

Diabetes mellitus (DM) is an emerging endocrine disease affecting domesticated dogs (Guptil, Glickman, & Glickman, 2003). Prevalence is currently estimated to be 0.34% (Mattin et al., 2014). Age and breed type are phenotypic risk factors that suggest that canine DM is a heterogeneous disease with an underlying genetic bias (Catchpole et al., 2013).

DM is characterised by hyperglycaemia, glucosuria and weight loss, resulting from a complete or relative deficiency of insulin (Kumar, Rekha Kumarj, Kumar, & Kumar, 2014). Treatment regimens are multi-faceted and include twice-daily insulin administration and diet modification, which is a complex task relying on owner compliance for success (Hamlin, 2011). Anecdotal evidence suggests developing a diabetes veterinary team can improve owner compliance, like standards set in human nursing (Niessen, 2015).

However, past literature has failed to confirm this suggestion or identify factors affecting compliance. Research within the human field indicates that nurses can spend more time with patients to achieve comparable physiological results and increased satisfaction than a general practitioner (Houweling et al., 2010).

The aims of this study were to investigate:

1. The relationship between the level of compliance to a treatment plan and the frequency and type of communication between the owners of diabetic dogs and different veterinary staff
2. The level of owner compliance to a treatment plan

Materials and methods

Participants

A quantitative research method, using purpose and volunteer sampling methods,

was utilised by distributing a questionnaire to owners of dogs diagnosed with insulin-deficient DM. The descriptive study was carried out online, at Bartram and Patrick Veterinary Surgery, West Yorkshire, and the People's Dispensary for Sick Animals, Edinburgh. The questionnaire was distributed and analysed as an observational study with a cross-sectional design that encompassed inclusion and exclusion criteria, but no randomisation procedures.

Charity and private veterinary practices were chosen to increase the types of participants included in the study. Inclusion criteria targeted the owners of living adult dogs who could independently complete the questionnaire. The patients had been receiving exogenous porcine insulin for more than six months to enrich the data gathered, as these participants were considered experienced in delivering care.

Data collection

This study had ethical approval from the School of Applied Sciences at Edinburgh Napier University.

The questionnaire consisted of 13 multiple-choice and textual questions. The questions gained information regarding owner and dog demographic data, the level of owner compliance and the frequency of communications. Questions were adapted from the human Diabetic Self Care Inventory that reports the frequency of self-care behaviours without assuming an ideal or identical regimen (Weinger, Butler, Welch, & La Greca, 2005).

Data analysis

Primary processing, grouping and coding was carried out using a database programme. Demographic and Likert data were presented using descriptive statistics, absolute figures and percentages. The relationship between the compliance score and the frequency of communication were sought by correlation using the non-parametric Spearman's rank method. Chi-square tests of independence determined the significance of any observed differences while providing information on exactly which categories account for any differences found. The remaining data were sent to Minitab (Version 15) where Kruskal-Wallis tests were carried out. The level of significance was $p < 0.05$.

Results

Compliance

Because treatment regimen for DM is multifaceted, participants were asked to rate the compliance to recommended treatment items using a Likert scale. The scale ranged from

- 1: never follow recommendations;
- 2: sometimes follow recommendations, mostly not;
- 3: follow recommendations 50% of the time;
- 4: usually follow recommendations, sometimes do not;
- 5: always do what is recommended;
- 0: not applicable.

Figure 1 illustrates the level of compliance to treatment options.

The data indicated high compliance to giving the correct insulin dose, attending appointments and giving insulin and meals at the recommended time. The level of compliance was reduced when asked how often the insulin dose was adjusted.

The compliance to giving approved snacks was lower than for giving measured food. Recording insulin doses had a median score of 4.5, but recording food intake was the least-compliant item. Of owners, 35% felt that measuring blood glucose was not applicable to them, indicating that this had not been recommended. This item had the most variable compliance.

The average compliance score was 0.9273/1.

Communication

Figure 2 illustrates how frequently participants utilise methods of communication. The scale ranged from 1: never to 5: always.

Contacting the veterinary practice via telephone and attending consultations with the VS were frequently used methods. Attending consultations with the VN was the most infrequently used method, as the modal category selected was never. The median score for receiving calls from the veterinary practice was low, but reporting concerns to the practice was more utilised.

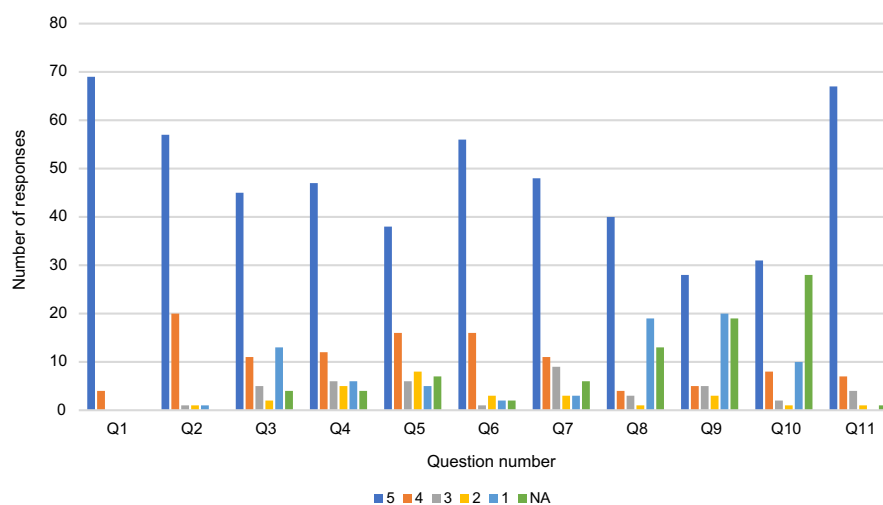


Figure 1.0 – Respondent's level of compliance to each treatment item detailed below –

Question 1 – Administering the correct insulin dose

Question 2 – Administering insulin dose at the correct time

Question 3 – Adjusting the insulin dose without advice

Question 4 – Giving measured amounts of food

Question 5 – Giving approved snacks

Question 6 – Giving meals at the correct time

Question 7 – Walking regularly

Question 8 – Recording insulin doses

Question 9 – Recording food intake

Question 10 – Measuring blood glucose

Question 11 – Attending routine appointments at the veterinary surgery

Figure 1. Respondent's level of compliance to each treatment item detailed below

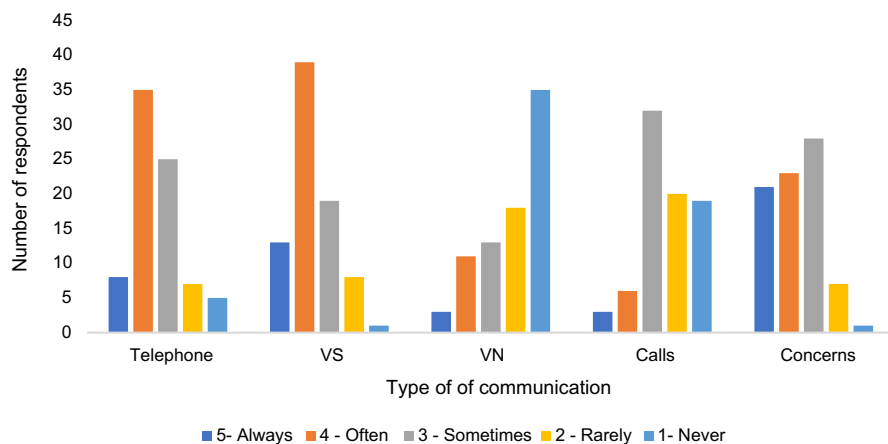


Figure 2. Respondent's reported frequency to five types of communication

Factors affecting compliance and frequency of communication

Spearman's rank correlation demonstrated no significant correlation between the frequency of communication and the overall compliance score. The insurance status did not affect the compliance score. However, respondents with insurance attended VN consultations more frequently than did those without insurance.

There was no significant difference between the median values of the compliance score between the types of practices. A chi-square test of independence demonstrated that attending private practice was associated with less-frequent attendance at VN consultations.

Respondents who were aware of the difference between a VN and a VS were more compliant. Those who are aware of the difference between the roles less frequently attend VN consultations and are in less-frequent receipt of telephone calls. The study demonstrated that these clients more frequently attend VS consultations and report concerns.

The time since diagnosis did not affect the compliance score. However, respondents owning a dog diagnosed with DM over 5 years ago more frequently reported concerns than those diagnosed more recently. The age of respondents did not affect the compliance and communication scores.

Discussion

The study showed a high compliance rate when giving accurate insulin doses and meals on time. Owners are expected to understand that there is little flexibility of dosing as glycaemic control is dependent on the administration of exogenous insulin and diet modification (Niessen, 2015). Such necessary treatment items can

prevent hyperglycaemia and hypoglycaemia (Hamlin, 2011).

Clients were less compliant when giving approved snacks, with more respondents stating that they were not recommended this. Physicians may lack the time and training to create comprehensive nutrition and exercise plans (Conlon, 2010). This may explain why clients were less compliant at recording food and insulin administration. Keeping records is a useful indirect method of monitoring trends and prompting evaluation (Cook, 2012). The process can be perceived as time-consuming, but education of the benefits can improve compliance (Daminet, Maele, & Rogier, 2005).

Of respondents, 35% stated that measuring blood glucose was not recommended. Typically, dogs are hospitalised to measure blood glucose concentrations, but the associated stress can result in anorexia, which may lead to inaccurate readings (Casella, Wess, Hässig, & Reusch, 2003). Additionally, owners often postpone rechecks due to inconvenience, as decisions are influenced by their financial situation, level of motivation and expectations (Cook, 2012). Owners may also be concerned of hurting their pet or taking incorrect samples, leading to variable compliance (Daminet et al., 2005). Home monitoring prevents these issues and, in humans, has improved diabetic control (Petrie, 2011).

DM treatment is considered expensive by owners (Aptekmann, Armstrong, Coradini, & Rand, 2014). The results suggest that telephone contact is a commonly utilised method, perhaps as it is convenient and inexpensive. However, most clients only received calls from their practice "sometimes". Although calls are time-consuming, they can improve compliance by

transporting the management of care to the home setting (Aliha et al., 2013). The present study contradicts these findings and reaches agreement with Lawson, Cohen, Richardson, Orrbine, and Pham (2005), who determined that calls may improve quality of life, but not compliance.

VS consultations were frequently attended, but most respondents "rarely" attended VN consultations. It is a legal requirement that the VS evaluates patients receiving medication every 6 months (BSAVA, 2016). As DM requires a significant financial commitment, clients may perceive VN consultations as an unnecessary expense. Analysis of the effect of insurance status supports this, as clients with insurance attended VN consultations more frequently than those without insurance. Coe, Adams, and Bonnett (2007) discovered that clients were concerned that recommendations were to drive the business rather than for healthcare considerations. However, in human medicine, nurse education has improved patient glycaemic control without affecting costs (Mousquès, Bourgueil, Le Fur, & Yilmaz, 2010).

It has been suggested that a lower socioeconomic status is associated with reduced compliance rates (Rolnick, Pawloski, Hedblom, Asche, & Bruzek, 2013). Those attending charity practices must be in receipt of benefits, suggesting that they belong to a lower socioeconomic group than clients who pay for treatment. The results demonstrated that the type of practice did not affect compliance.

The charity practice included in the study is part of a franchise with procedures that stipulate that clients must be assigned VN consultations wherever possible. Respondents attending a private practice attended VN consultations less frequently than did those attending a charity practice. The charity practice protocol minimises costs and capitalises on the skills of professionals by promoting interdisciplinary partnerships that permit greater productivity (Litaker et al., 2003).

Of respondents, 88.3% were aware of the difference between the role of the VN and VS. This awareness was associated with increased compliance and infrequent attendance to VN consultations. This suggests that VNs are beneficial to improving compliance, but signifies limitations in the delivery of services. This follows the trend seen in human nursing where societal expectations of the role have changed (Yeates, 2014).

Respondents owning a dog diagnosed more than 5 years ago more frequently reported concerns to the practice. The mean survival time is estimated to be 17.3 months following diagnosis (Mattin et al., 2014). The owners will be experienced in detecting clinical signs and the patient will have been treated by a practice for numerous years, resulting in a client–practice bond where the client feels comfortable reporting concerns (Gower, 2014).

To overcome non-compliance, treatment must be suited to the owners' age and lifestyle (Niessen, 2015). The likelihood of debilitating comorbidities increases with advancing age, which increases the difficulties of injecting insulin (Shelmet et al., 2004). However, conflicting studies indicate that non-adherence is higher in younger patients (Yang et al., 2009). The results of the present study contrast these findings as no association was found between owner age and compliance or the frequency of communication.

Recommendations

The current project showed that DM requires a multifaceted treatment plan that is affected by varying factors. The study demonstrated that the frequency of communication did not affect compliance, but identified multiple variants that have been unexplored in previous research.

Nutrition, record-keeping and home blood glucose monitoring were treatment items that had low variable compliance and were infrequently recommended. A lack of detailed advice and education is a major factor of poor compliance (Shelmet et al., 2004). However, the VS is often under pressure in a time-restricted consultation to form a unique treatment plan (Gower, 2014). Thus, the identification of areas requiring further education will allow veterinary practices to provide specific education to improve owner compliance and patient welfare.

The study identified that telephoning clients and attending VN consultations were underutilised as clients may be unaware of the benefits. The financial commitment of DM treatment appears to be a limiting factor in the utilisation of additional treatment options. The study recommends that staff promote the benefits provided by VN consultations as they may decrease the client's long-term financial burden. Collaboration between the owner, VS and

VN will reduce the pressure placed on the VS, improve practice financial remuneration and result in more satisfied VNs.

Furthermore, the results suggest that owners and canines may benefit from a stronger client–practice bond. This is valuable information as increasing client support may strengthen the bond and increase the frequency of reporting concerns, leading to a quicker resolution of clinical signs.

Conclusion

The study provided an insight for veterinary practices by identifying factors that affect owner compliance and the frequency of communication. Financial constraints and a lack of education appear to be contributing factors to the underutilisation of veterinary services. The requirement for veterinary practices to educate clients of the benefits of advised treatments was exposed as a crucial step to improving the care of diabetic dogs. A flexible approach to the development of treatment plans which involved consideration of owner factors was implied.

The suggestions for future practice may accomplish a better quality of life for the canine, while reducing owner stress regarding treatment complexity and finance.

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