OBSERVATIONS

Diabetic Alert Dogs: A Preliminary Survey of Current Users

Methods for monitoring blood glucose (BG) levels play many essential roles in diabetes management, and one of the most important is alerting individuals to the occurrence of hypoglycemia. A growing number of individuals with diabetes are turning to the use of Diabetic Alert Dogs (DADs) for hypoglycemia detection, despite their high cost. Testimonials from DAD owners and trainers have reported in the media that the accuracy of trained canine alerts matches that of BG monitoring technology (1,2) and described other benefits attributed to DADs, including improvements in glycemic control and quality of life (QoL). However, with the exception of one abstract from a case study (3) there is no scientific evidence that confirms the ability of DADs to detect hypoglycemia accurately or to improve clinical outcomes and QoL. We have recently conducted an exploratory study based on a survey of DAD owners from a Virginia-based nonprofit organization, Service Dogs by Warren Retrievers, Inc. (SDWR).

To gain information about their clients' experiences, SDWR conducted an online survey, which was completed by 36 DAD owners—23 parents of children and 13 adults with type 1 diabetes (means/standard deviations of child/adult age 8.4/3.1 and 36.4/14.1, respectively). Data were deidentified by SDWR then sent to the University of Virginia for analysis, and the study was approved as exempt by the University of Virginia Institutional Review Board. Survey items inquired about the accuracy of DAD alerts, as well as frequency of hypoglycemia, diabetes control, and QoL prior to and since DAD placement.

DAD accuracy—Respondents were asked how frequently they experienced hypoglycemia with no corresponding DAD alert in the past month. Over one-third (36.1%) reported no occurrences without a DAD alert in this time period, 27.8% reported fewer than one event per week, and 36.1% reported more than one per week. Nearly all respondents (91.7%) reported that DAD alerts occurred at BG levels between 3.3–3.9 mmol/L.

Clinical outcomes—Respondents reported significant decreases in the frequency of severe ($P = 0.039$) and moderate ($P = 0.02$) hypoglycemia since DAD placement, as well as glycosylated hemoglobin levels ($P = 0.001$).

Psychosocial outcomes—The majority of respondents reported decreased worry about hypoglycemia (61.1%) and hyperglycemia (61.1%), improved QoL (75%), and the ability to participate in physical activities (75%).

A number of significant methodological limitations should be considered when interpreting these findings, including the small number of respondents, as well as the subjective and retrospective nature of the survey data. Obviously, prospective studies of larger numbers of DAD owners, with objective measures to assess DAD accuracy and clinical outcomes are needed. Nonetheless, these preliminary findings provide some encouraging evidence about the potential benefits of DAD use. Although DAD owners did not all report perfect accuracy, this is not surprising given that BG monitoring technology is also not perfectly accurate at BG levels <75 mg/dL or 4.2 mmol/L (4). On the basis of these positive exploratory findings, more research into the use of DADs in diabetes management appears warranted, including scientifically rigorous studies comparing the accuracy of DAD alerts to that of BG monitoring devices (5).

LINDA GONDER-FREDERICK, PHD[1]
PAM RICE, BA[2]
DAN WARREN[2]
KAREN VAJDA, BA[1]
JACLYN SHEPARD, PSYD[1]

From the [1]Behavioral Medicine Center, University of Virginia, Charlottesville, Virginia; and [2]Service Dogs by Warren Retrievers, Inc., Culpeper, Virginia.
Corresponding author: Linda Gonder-Frederick, lag3g@virginia.edu.
DOI: 10.2337/dc12-1998
© 2013 by the American Diabetes Association. Readers may use this article as long as the work is properly cited, the use is educational and not for profit, and the work is not altered. See http://creativecommons.org/licenses/by-nc-nd/3.0/ for details.

Acknowledgments—D.W. is the CEO of Service Dogs by Warren Retrievers, Inc. (SDWR). P.R. is a client of SDWR. No other potential conflicts of interest relevant to this article were reported.

L.G.-F. supervised data analysis and interpretation and manuscript preparation and editing. P.R. and D.W. researched data and edited the manuscript. K.V. analyzed data, contributed to data interpretation, and edited the manuscript. J.S. contributed to data interpretation and edited the manuscript. L.G.-F. is the guarantor of this work and, as such, had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

The authors thank Dallas Ducar and Jean Pak, University of Virginia, for editorial assistance.

References

1. Spake A. Could a dog save your life? No one knows for sure how they do it, but a growing number of canine companions are helping people with diabetes avoid dangerous hypoglycemia. Diabetes Forecast 2008;61:40–47
2. Taylor RF. 5-year-old's pup can detect diabetes ups and downs [Article online], 3 April 2012. *The Winchester Star*. Available from http://www.10tv.com/content/stories/apexchange/2012/04/03/va–diabetes-dog.html. Accessed 27 September 2012
3. Hardin DS, Hillman D, Cattat J. Hypoglycemia alert dogs—innovative assistance for people with type 1 diabetes. Diabetes 2012; 61(Suppl. 1):A99
4. Freckmann G, Baumstark A, Jendrike N, et al. System accuracy evaluation of 27 blood glucose monitoring systems according to DIN EN ISO 15197. Diabetes Technol Ther 2010;12:221–231
5. Tonyushkina K, Nichols JH. Glucose meters: a review of technical challenges to obtaining accurate results. J Diabetes Sci Tech 2009;3:971–980