

Yoga May Improve Quality of Life, Sleep in Cancer Survivors

BY DOUG BRUNK

FROM AN AMERICAN SOCIETY OF CLINICAL ONCOLOGY PRESSCAST

Yoga, widely practiced for maintaining flexibility and coping with stress, may also benefit cancer survivors who report impaired sleep quality and fatigue, results from a nationwide study demonstrated.

During a press briefing sponsored by the American Society of Clinical Oncology, lead author Karen Mustian, Ph.D., of the University of Rochester (N.Y.) Medical Center, discussed results from what she said is the largest randomized, controlled study to date examining a yoga program designed specifically for cancer survivors.

The researchers used the University of Rochester Cancer Center Community Clinical Oncology Program (CCOP) Research Base to conduct a phase II/III clinical trial at nine CCOP centers, examining the efficacy of yoga for improving sleep quality, fatigue, and quality of life among 410 cancer survivors who reported problems sleeping after completing adjuvant therapy for their cancer.

To be eligible, patients were required to have a sleep disturbance level of 3 or greater on a scale ranging from 0-10, Dr. Mustian said. Those who had attended a yoga class within the last 3 months were excluded, as were those with sleep apnea and those with distant metastatic disease.

Patients were randomized to standard follow-up care or to standard follow-up care plus enrollment in Yoga for Cancer Survivors, (YOCAS), which encompasses components of hatha yoga and restorative yoga, including postures, breathing exercises, and mindfulness (including meditation exercises and visualization). The 75-minute classes met twice a week for 4 weeks.

At baseline and at the end of 4 weeks the researchers used the Pittsburgh Sleep Quality Index (PSQI) to measure sleep, the Multidimensional Fatigue Symptom Inventory to measure fatigue, and the Functional Assessment of Chronic Illness Therapy measurement system to assess quality of life. The mean age of participants was 56, most (96%) were female, and 75% were breast cancer patients.

Dr. Mustian reported that at the end of 4 weeks patients in the yoga group improved their overall sleep quality by 22%, while patients in the control group improved their overall sleep quality by 12%, a difference that was statistically significant.

At baseline, 84% of patients in the yoga group and 83% of patients in the control group had clinically impaired sleep quality defined as a PSQI score of 5 or higher. At the end of the 4-week study, 31% of patients in the yoga group recovered and no longer had clinically impaired sleep quality, while only 16% of patients in the control group recovered.

Dr. Mustian also reported that, compared with their counterparts in the con-

trol group, patients in the yoga group had significantly greater reductions in fatigue (42% vs. 12%, respectively), daytime sleepiness (29% vs. 5%), and quality of life (6% vs. 0%). In addition, use of sleep medication decreased by 21% in the yoga group but increased by 5% in the control group.

The trial was funded by grants from the National Cancer Institute.



©NOAM ARMONI/ISTOCKPHOTO.COM

The Yoga for Cancer Survivors program encompasses components of hatha yoga and restorative yoga, including postures and mindfulness.

If you think all basal insulins are the same, think again

The topic of insulin and cancer has garnered increased attention with the publication of 4 retrospective studies in *Diabetologia* that investigate the potential role of a specific basal insulin analog in cancer risk.¹⁻⁴

For decades, researchers have investigated the relationship between insulin and IGF-1 receptor activation and the development of certain cancers.⁵ To date, the clinical significance of the in vitro activity of IGF-1R has not been established.

The Novo Nordisk philosophy of engineering insulin and IGF-1R affinity

Novo Nordisk has been working on refining the attributes of insulin for more than 85 years, redesigning the insulin molecule with a focus on efficacy and safety.

We have developed insulin analogs that work like normal human insulin but which have a more consistent and predictable absorption profile associated with a low risk of hypoglycemia, the most common adverse event with insulin use.⁶⁻⁸

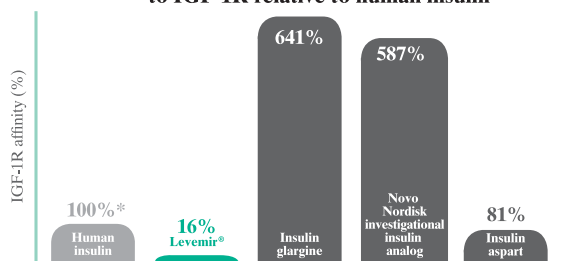
In 1992, Novo Nordisk stopped development of a rapid-acting investigational insulin analog when laboratory testing revealed it had undesirable mitogenic side-effects.⁹ A toxico-pharmacological evaluation indicated the compound's affinity to IGF-1R was high, one possible cause of the tumor growth.⁹

With work on this investigational compound discontinued, Novo Nordisk adopted a philosophy that all future insulins cannot have a greater binding affinity to IGF-1R and the insulin receptor (IR) than human insulin, the relevant comparator against which binding affinity is measured.⁹

Levemir® was designed with a low affinity to IGF-1R

Levemir® was designed with the lessons of the earlier investigational insulin analog in mind, with a specific fatty acid side chain to LysB29 to prolong its absorption and provide steady plasma levels while also having a lower IGF-1R affinity than human insulin.¹⁰

Levemir® was shown to have a low affinity to IGF-1R relative to human insulin¹⁰



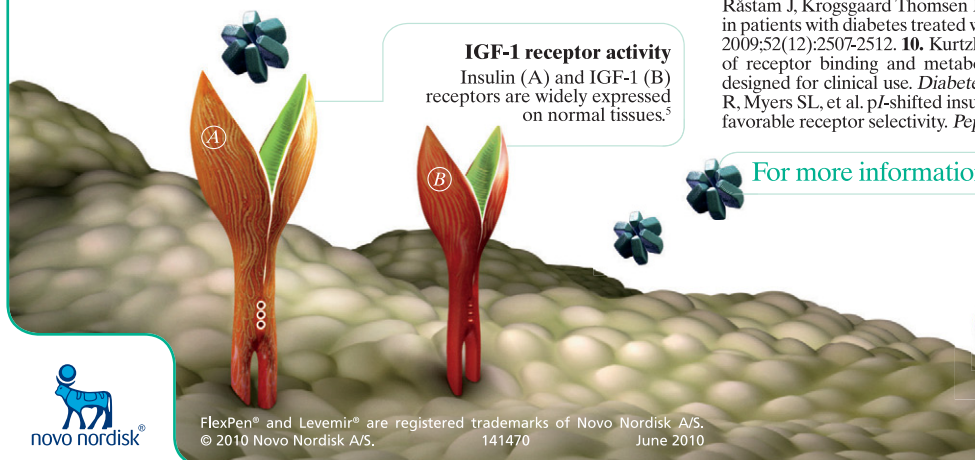
*Human insulin is the relevant comparator against which IGF-1R affinity was measured.

An in vitro study that compared the insulin- and IGF-1R-binding properties and the metabolic and mitogenic potencies of the rapid-acting and long-acting insulin analogs with human insulin. IGF-1R affinity was measured using purified human IGF-1R.¹⁰

In another study, conducted by Lilly Research Laboratories, insulin glargine had an affinity to IGF-1R of 551% compared with 100% for human insulin.¹¹

The clinical significance of the in vitro activity of IGF-1R has not been established.

IGF-1 receptor activity
Insulin (A) and IGF-1 (B) receptors are widely expressed on normal tissues.⁵



FlexPen® and Levemir® are registered trademarks of Novo Nordisk A/S. © 2010 Novo Nordisk A/S. 141470 June 2010

Indications and usage

Levemir® is indicated for once- or twice-daily subcutaneous administration for the treatment of adult and pediatric patients with type 1 diabetes mellitus or adult patients with type 2 diabetes mellitus who require basal (long-acting) insulin for the control of hyperglycemia.

Important safety information

Levemir® is contraindicated in patients hypersensitive to insulin detemir or one of its excipients.

Levemir® should not be diluted or mixed with any other insulin preparations.

Hypoglycemia is the most common adverse effect of all insulin therapies, including Levemir®. As with other insulins, the timing of hypoglycemic events may differ among various insulin preparations. Glucose monitoring is recommended for all patients with diabetes. Levemir® is not to be used in insulin infusion pumps. Any change of insulin dose should be made cautiously and only under medical supervision. Concomitant oral antidiabetes treatment may require adjustment.

Needles and Levemir® FlexPen® must not be shared.

Inadequate dosing or discontinuation of treatment may lead to hyperglycemia and, in patients with type 1 diabetes, diabetic ketoacidosis. Insulin may cause sodium retention and edema, particularly if previously poor metabolic control is improved by intensified insulin therapy. Dose and timing of administration may need to be adjusted to reduce the risk of hypoglycemia in patients being switched to Levemir® from other intermediate or long-acting insulin preparations. The dose of Levemir® may need to be adjusted in patients with renal or hepatic impairment.

Other adverse events commonly associated with insulin therapy may include injection site reactions (on average, 3% to 4% of patients in clinical trials) such as lipodystrophy, redness, pain, itching, hives, swelling, and inflammation. Less common but more serious are severe cases of generalized allergy, including anaphylactic reaction, which may be life threatening.

Please see brief summary of Prescribing Information on adjacent page.

References: 1. Currie CJ, Poole CD, Gale EA. The influence of glucose-lowering therapies on cancer risk in type 2 diabetes. *Diabetologia*. 2009;52(9):1766-1777. 2. Colhoun HM; SDRN Epidemiology Group. Use of insulin glargine and cancer incidence in Scotland: a study from the Scottish Diabetes Research Network Epidemiology Group. *Diabetologia*. 2009;52(9):1755-1765. 3. Jonasson JM, Ljung R, Talbäck M, Haglund B, Gudbjörnsdóttir S, Steineck G. Insulin glargine use and short-term incidence of malignancies—a population-based follow-up study in Sweden. *Diabetologia*. 2009;52(9):1745-1754. 4. Hemkens LG, Grouven U, Bender R, et al. Risk of malignancies in patients with diabetes treated with human insulin or insulin analogues: a cohort study. *Diabetologia*. 2009;52(9):1732-1744. 5. Pollak M. Insulin and insulin-like growth factor signalling in neoplasia. *Nat Rev Cancer*. 2008;8(12):915-928. 6. Klein O, Lyngé J, Endahl L, Damholt B, Nosek L, Heise T. Albumin-bound basal insulin analogues (insulin detemir and NN344): comparable time-action profiles but less variability than insulin glargine in type 2 diabetes. *Diabetes Obes Metab*. 2007;9(3):290-299. 7. Heise T, Nosek L, Rønn BB, et al. Lower within-subject variability of insulin detemir in comparison to NPH insulin and insulin glargine in people with type 1 diabetes. *Diabetes*. 2004;53(6):1614-1620. 8. Danne T, Datz N, Endahl L, et al. Insulin detemir is characterized by a more reproducible pharmacokinetic profile than insulin glargine in children and adolescents with type 1 diabetes: results from a randomized, double-blind, controlled trial. *Pediatr Diabetes*. 2008;9(6):554-560. 9. Dejgaard A, Lynggaard H, Råstam J, Krogsgaard Thomsen M. No evidence of increased risk of malignancies in patients with diabetes treated with insulin detemir: a meta-analysis. *Diabetologia*. 2009;52(12):2507-2512. 10. Kurtzhals P, Schäffer L, Sørensen A, et al. Correlations of receptor binding and metabolic and mitogenic potencies of insulin analogs designed for clinical use. *Diabetes*. 2000;49(6):999-1005. 11. Kohn WD, Micanovic R, Myers SL, et al. pI-shifted insulin analogs with extended in vivo time action and favorable receptor selectivity. *Peptides*. 2007;28(4):935-948.

For more information, visit www.IGF1Raffinity.com



Levemir®
insulin detemir (rDNA origin) injection