

ORIGINAL RESEARCH

Yoga Therapy For NIDDM; a controlled trial

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Summary

Objective - To study the potential of yoga therapy as an aid to the management of non-insulin-dependent diabetes mellitus (NIDDM).

Design - A randomized trial comparing the policy of offering yoga classes with that of non - intervention,

Setting - Royal Free Hospital, London.

Patients - 21 patients with NIDDM, taking medication (13) or on diet control alone (8).

Intervention - Patients were randomized to control (11) and yoga (10) group. Both continued their normal medication and diet. The control group had no additional intervention. The yoga group was offered yoga classes with a standard set of postural, breathing and relaxation exercises; most patients attended one or two classes per week and practiced one or more times per week at home.

Main outcome measures - Fasting blood glucose (FBG) and located hemoglobin (HbA1c), assayed before randomization and after 12 weeks of yoga.

Results - Both FBG and HbA1c improved significantly ($P < 0.05$) in the yoga group, compared to the controls, three patients in the yoga group were able to reduce their medication. Most patients in the yoga group wanted to continue attending yoga classes, and reported feeling better, less anxious and more in control of themselves. No adverse effects were observed.

Conclusions - Offering yoga classes to NIDDM patients at a diabetic clinic attracted significant numbers of patients and led to improved glucose homeostasis. Further work is required to (a) optimize the yoga effect, (b) assess its range of applicability, (c) compare its efficacy to that of other behavioral interventions and (d) determine its mode of action.

INTRODUCTION

Yoga offers a largely unexplored, widely available resource for the management of stress-related ailments. Research has demonstrated its effectiveness for hypertension¹, bronchial asthma² and several other conditions³. The recent report that a combination of diet, exercise and yoga can reverse coronary heart disease⁴ has drawn widespread interest. There is evidence⁵ that yoga can also benefit people with non-insulin-dependent diabetes mellitus (NIDDM). We report here the first randomized, controlled trial of yoga for NIDDM. We have simply compared yoga with non-intervention, omitting controls for attention and exercise. While these may well contribute to the effects of yoga, they are themselves known to be complex phenomena, and we consider it to be judicious to make a preliminary confirmation that yoga is feasible and beneficial before embarking on expensive investigations into all its possible modes.

RESULTS

Table 2 shows that FBG decreased in the yoga group but increased in the controls, the difference between the changes in the two groups being 0.60-(-1.20)-1.80($P < 0.05$; 95% confidence limits 0.27- 3.33). The corresponding changes in HbA1c were 1.56-(-0.20)=1.76($P < 0.05$; 95% confidence limits 0.20-3.32). Table 3 shows that similar confidence limits for the changes were obtained using the final values for FBG (or HbA1) adjusted by covariate analysis for sex, age and initial FBG (or HbA1)

Since FBG reflects glucose control at the time of blood sampling, and HbA1c reflects average glucose levels over the previous (approximately) six weeks, it follows that glucose levels in the yoga group fell significantly, relative to the controls, both at a single time point, after 12 weeks of yoga, and over the preceding (approximately) six weeks. Three of the patients in the yoga group were able to reduce their dose of tablets, since their blood glucose levels fell markedly following the initiation of yoga therapy. It follows that glucose homeostasis improved in the yoga group compared to the non-intervention group.

Questionnaires, administered by post, indicated that all the patients in the yoga group, except one, wanted to continue attending yoga classes, and the majority felt better, less anxious and more in control of them selves. Two reported improved mobility. No adverse effects were observed.

Table II : Fasting blood glucose (FBG) and glycated haemoglobin (HbA1c) before and after 12 weeks of yoa

	FBG (SD) HbA1c (SD) (mmolc/ l)		FBG (SD) HbA1c (SD) (% Hb)	
	Yoga	Control	Yoga	Control
No. of cases	11	10	11	10
Mean before	8.7 (3.9)	7.6 (1.9)	10.3 (3.4)	8.9 (2.3)
Mean after	8.1 (4.1)	8.8 (3.0)	8.7 (2.4)	9.1 (1.2)
Difference	0.60 (1.6)	-1.20 (1.8)	1.56 (1.8)	-0.20 (1.6)

Table III : Mean changes in FBG and HbA1c (after minus before 12 weeks of yoga), adjusted by covariate analysis for sex, age and initial FBG. 95% CL = 95% confidence.

	FBG (SD)	HbA1c
Yoga (11)	7.7 (1.7)	8.3 (1.2)
Control (10)	9.3 (1.7)	9.5 (1.2)
Diff (95% CL)	1.576 (0.01,3.5)	1.205 (0.13, 2.29)

DISCUSSION

The fasting blood glucose and HbA1c assays show that glucose homeostasis improved in the yoga group, compared to the controls, over the 12-week period of the trial. The three reductions of medication in the yoga group, with no reductions in the control group, strengthen this conclusion.

Our yoga 'package' included several different components, known to help with glucose control in NIDDM, including exercise, diet, relaxation and counseling. The effect of exercise in increasing glucose utilization would have been small, since the yoga employed is very gentle and the average heart rate over a yoga session is about the same as the resting level; exercise therapy for diabetes involves at least half an hour of active exercise with heart rate well above the resting level.

Surwit and Feingloss⁸ reported that relaxation training leads improved glucose tolerance in NIDDM patients without affecting insulin sensitivity or glucose-stimulated insulin secretary activity. This could be mediated by decreases in sympathetic and adrenal cortical activity. Yoga

presumably has similar effects but may also act in other ways, since it includes postural and breathing exercises in addition to simple relaxation.

It might be argued that attention, alone, could have caused the observed effects, since the control group did not have periods of attention, matching those of the yoga classes. It would be difficult to rule out such a possibility, since attention is a complex process, and the quality of attention provided by yoga instructor undoubtedly contributes to the effectiveness of the therapy. To study this scientifically will require considerable sophistication, since attention in a yoga class cannot readily be dissociated from the practices being taught; controls for attention cannot be administered like placebo tablets in drug trials. However, this methodological difficulty does not detract from the evidence that yoga can benefit people with NIDDM. The potentials of yoga as a therapy for NIDDM must stand upon comparison with other therapies (including those based primarily on attention). Before this can critically be accomplished, yoga therapy for NIDDM must be further characterized.

The absence of adverse effect is consistent with observations by one of us (RN), at her yoga therapy clinic, on hundreds of cases of diabetes. It might be thought that yoga could exacerbate the tendency to neuropathic arthropathy in people with diabetes but, contrary to popular misconceptions, therapeutic yoga uses very gentle exercises (with body awareness), and avoids putting any strain on the musculoskeletal system. Indeed, yoga may offer a viable alternative to exercise therapy in cases of arthropathy, and might actually benefit the condition.

Yoga therapy for NIDDM should now be studied to (a) optimize it, (b) determine the extent to which the effects are due to exercise, relaxation, 'attention placebo' or other factors and (c) compare its efficacy and range of applicability to those of other behavioral intervention.

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