



ORIGINAL ARTICLE

Lifestyle interventions for diabetes mellitus type 2 prevention[☆]



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Quality of life;
Cost-effectiveness;
Cost-utility

Abstract

Background and aims: Transferring the results from clinical trials on type 2 diabetes prevention is the objective of the Diabetes in Europe-Prevention using Lifestyle, Physical Activity and Nutritional intervention (DE-PLAN) project in Catalonia, whose cost-effectiveness analysis is now presented.

Patients and methods: A prospective cohort study was performed in primary care involving individuals without diagnosed diabetes aged 45–75 years ($n=2054$) screened using the questionnaire Finnish Diabetes Risk Score (FINDRISC) and a subsequent oral glucose tolerance test. Where feasible, high-risk individuals who were identified ($n=552$) were allocated sequentially to standard care ($n=219$), a group-based ($n=230$) or an individual-level ($n=103$) intensive (structured programme of 6 h using specific teaching techniques) lifestyle intervention ($n=333$). The primary outcome was the development of diabetes (WHO). We evaluated the cost of resources used with comparison of standard care and the intervention groups in terms of effectiveness and quality of life (15D questionnaire).

Results: After 4.2-year median follow-up, the cumulative incidences were 18.3% (14.3–22.9%) in the intensive intervention group and 28.8% (22.9–35.3%) in the standard care group (36.5% relative-risk-reduction). The corresponding 4-year HR was 0.64 (0.47–0.87; $P<.004$). The incremental cost induced by intensive intervention compared with the standard was 106€ per participant in the individual level and 10€ in the group-based intervention representing 746€ and 108€ per averted case of diabetes, respectively. The estimated incremental cost-utility ratio was 3243€ per quality-adjusted life-years gained.

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PALABRAS CLAVE

Diabetes;
 Prediabetes;
 Intolerancia a la
 glucosa;
 Glucemia basal
 alterada;
 Incidencia;
 Prevención;
 Efectividad;
 Calidad de vida;
 Coste-efectividad;
 Coste-utilidad

Conclusion: The intensive lifestyle intervention delayed the development of diabetes and was efficient in economic analysis.

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Coste-efectividad de la intervención sobre el estilo de vida para prevenir la diabetes tipo 2

Resumen

Antecedentes y objetivos: Tasladar los resultados de los ensayos clínicos sobre prevención de la diabetes mellitus tipo 2 (DM2) es el objetivo del proyecto *Diabetes in Europe-Prevention using Lifestyle, Physical Activity and Nutritional intervention* (DE-PLAN) en Cataluña. En este trabajo se presenta un análisis de coste-efectividad de varias intervenciones para prevenir la DM2.

Pacientes y métodos: Estudio prospectivo de cohortes en el ámbito de la atención primaria. Participaron 2.054 sujetos de 45-75 años sin DM2 diagnosticada (n=2.054), que rellenaron el cuestionario *Finnish Diabetes Risk Score* (FINDRISC) y una sobrecarga oral con glucosa. Cuando fue factible, los participantes con riesgo de DM2 (n=552) se asignaron consecutivamente a una intervención estandarizada (n=219) o bien a una intervención intensiva (programa estructurado de 6 h usando técnicas didácticas específicas) sobre el estilo de vida (n=333): de forma grupal (n=230) o bien individual (n=103). El indicador primario de efectividad fue la incidencia de DM2 (criterios de la OMS), comparando los costes de recursos utilizados en cada grupo según efectividad y calidad de vida (cuestionario 15D).

Resultados: Tras 4,2 años de mediana, la incidencia acumulada de DM2 fue del 18,3% (rango: 14,3-22,9%) en intervención intensiva y 28,8% (22,9-35,3%) en estandarizada (36,5% reducción-riesgo-relativo), con un HR=0,64 (0,47-0,87; p<0,004). El incremento del coste generado por la intervención intensiva respecto a la estandarizada fue de 106 € por participante en la modalidad individual y 10 € en la grupal, representando 746 y 108 € por caso evitado de diabetes, respectivamente. La intervención intensiva comportó un sobrecoste de 3.243 € por año de vida ganado, ajustado por calidad.

Conclusión: La intervención intensiva sobre el estilo de vida demoró el desarrollo de diabetes y fue eficiente en términos económicos.

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Introduction

The effectiveness of intensive lifestyle interventions to prevent, or at least delay, the onset of type 2 diabetes mellitus (DM2) has been demonstrated.¹ In addition, the long-term persistent preventive effect has been observed. In Spain, however, both the initial application of interventions and their transfer into the public health system remain a dream.²⁻⁴

In 2006, the International Diabetes Federation (IDF) requested the adaptation of the preventive measures to the reality of each country, as well as an analysis of effectiveness.⁵ Finland, Germany and The Netherlands immediately started diabetes prevention programs with government and legislative support.⁶ Catalonia also started the European public health project *Diabetes in Europe-Prevention using Lifestyle, Physical Activity and Nutritional Intervention* (DE-PLAN), which has shown the usefulness of the Finnish Diabetes Risk Score (FINDRISC) scale for screening for glucidic disorders and the feasibility and efficacy of intensive lifestyle interventions in primary care in high-risk subjects.⁷⁻⁹ However, having effective measures does not mean that they are also cost-effective.

In Spain, DM2 consumes 15% of the state budget allocated to health. The costs of DM2 usually begin before

diagnosis; it is therefore advisable to increase the investment in prevention.^{10,11} In fact, various studies support the cost-effectiveness of intervening in early stages of the disease, particularly in subjects with impaired glucose tolerance (IGT) and impaired fasting glucose (IFG), diagnoses that constitute the category of prediabetes.^{1,9-12} The majority of analyses are contextualized from clinical trials, which have little or nothing to do with the reality of primary care. Computer simulation models are then applied to these analyses.⁶ There are very few analyses (and virtually none in Spain) of the costs of the process and the preventive intervention itself under the actual conditions of clinical practice in the public health system.

The aim of this study was to perform a cost analysis, compared with the effectiveness and quality of life perceived by the participants, of DM2 prevention, conducted entirely within the primary care setting of Spain.

Patients and method

The European project DE-PLAN in Catalonia was designed in 2 phases: a cross-sectional (1 year) screening and a longitudinal (4 years) cohort follow-up.⁷ This public health study assessed the viability and effectiveness of an intensive, structured lifestyle intervention in primary care, in

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