Cirugía metabólica: visión del Endocrinólogo

PONTEVEDRA-23/04/2010

Dr. Miguel A. Martínez Olmos

Unidad de Desórdenes Alimentarios

Servicio de Endocrinología y Nutrición

Hospital de Conxo. CHUS.

- La diabetes mellitus afecta a más de 150 millones de personas en el mundo, y se espera que esta cifra se doble antes del 2025.
- La mayoría de estos pacientes sufren diabetes mellitus tipo 2 que se caracteriza en unos casos por la presencia de insulinorresistencia, aumento de la producción endógena de glucosa y fallo progresivo de las células beta pancreáticas en la producción de insulina, y en otros una disminución de la secreción de insulina sobre todo en su fase temprana.

- Experimentalmente se ha demostrado que la administración de glucosa por vía oral produce un mayor aumento de la insulinemia que la administración de glucosa por vía endovenosa a igualdad de glucemias plasmáticas. Se trata del denominado **efecto incretina**.

- Dos hormonas que se segregan a nivel intestinal, el glucagon-like peptide-1 (GLP-1) y el glucose-dependent insulinotropic polypeptide (GIP), estarían involucradas en este mecanismo que provocaría el aumento de la insulina cuando es necesaria.

- Además el **GLP-1** tendría un **efecto trófico** que preservaría las células beta pancreáticas por aumento de su neogénesis y disminución de su destrucción o apoptosis, así como disminuiría la secreción de glucagón, potente hormona hiperglucemiante, enlentecería el vaciamiento gástrico y la secreción ácida.

GLP-1 puede influir en la función y la masa de las células β

- GLP-1 ha demostrado:
  - Aumentar la producción insulínica de las células β (en animales y humanos)
  - Aumentar el grado de respuesta a la glucosa de las células β (en animales y humanos)
  - Inhibir la pérdida de células β /aumentar la neogénesis de las células β (en animales)

Kjems LL, et al. *Diabetes*. 2003;52:380-386.; Delmeire D, et al. *Biochem Pharmacol.* 2004;68:33-39.; Farilla L, et al. *Endocrinology.* 2003;144:5149-5158.; Tourrel C, et al. *Diabetes.* 2002;51:1443-1452.

- En los pacientes diabéticos tipo 2 la secreción de GLP-1 está dañada aunque se conserva su mecanismo de acción, mientras que la secreción de GIP sería normal pero se perdería su actividad.

- El péptido YY (PYY), otra hormona segregada en el tracto intestinal distal junto al GLP-1, estaría disminuido tras la ingesta de alimentos en pacientes con diabetes mellitus 2 y en obesos.
- La infusión de PYY produce saciedad y disminución de la insulinorresistencia.

Consecuencias de la dieta actual

- Datos anatómicos, fisiológicos y evolutivos presentan al tracto digestivo alto como un receptor de alimentos ricos en fibra e hipocalóricos.
- Con las actuales dietas refinadas e hipercalóricas, se produciría un aumento de la absorción de nutrientes en duodeno y yeyuno que se hipertrofiarían por efecto del glucagon-like peptide-2 (GLP-2), y por ende una disminución de la absorción en el ileon terminal.
- La llegada de alimentos al ileon terminal, carbohidratos y grasas produce un aumento de la secreción de GLP-1 y PYY que en los diabéticos tipo 2 estaría disminuida.

Las Incretinas Tienen Funciones Fisiológicas Importantes

- Las incretinas son hormonas segregadas por las células endocrinas del intestino en respuesta a la ingesta de nutrientes

- Las incretinas influyen en la homeostasis de la glucosa a través de acciones múltiples incluyendo la secreción de insulina dependiente de glucosa, la supresión del glucagón postprandial, y el enlentecimiento del vaciamiento gástrico

- Las incretinas fueron identificadas cuando se descubrió que la glucosa administrada por vía oral producía mayor estimulación de la liberación de insulina que cuando se alcanzaba un nivel de glucosa equivalente por infusión intravenosa
  - Este fenómeno bien descrito se denomina "efecto incretina"
  - El efecto incretina representa ~60% de la liberación total de insulina después de una comida

Drucker DJ. *Diabetes Care.* 2003;26:2929-2940.; Perley MJ, Kipnis DM. *J Clin Invest.* 1967;46:1954-1962.; Nauck M, et al. *Diabetologia*. 1986;29:46-52.

- La cirugía bariátrica, empleada en pacientes con obesidad mórbida (índice de masa corporal superior a 40 kg/m2) o en pacientes con obesidad grado 2 (índice superior a 35) con comorbilidades mayores (diabetes mellitus 2, síndrome metabólico, hipertensión arterial, apnea del sueño o enfermedades osteoarticulares), produce una mejoría del control metabólico en los pacientes con diabetes mellitus 2 que es previo y más acentuado que lo esperable por la disminución concomitante de peso.

OBES SURG (2010) 20:549–558
DOI 10.1007/s11695-010-0102-6

CLINICAL RESEARCH

Bileopancreatic Diversion with Duodenal Switch Lowers Both Early and Late Phases of Glucose, Insulin and Proinsulin Responses After Meal

Hans-Erik Johansson · Arvo Haenni · F. Anders Karlsson · Britt Edén-Engström · Margareta Öhrvall · Magnus Sundbom · Björn Zethelius

H.-E. Johansson (✉) · A. Haenni · M. Öhrvall · B. Zethelius
Department of Public Health and Caring Sciences/Geriatrics,
Uppsala University Hospital,
Uppsala Science Park,
75185 Uppsala, Sweden
e-mail: hans-erik.johansson@pubcare.uu.se

F. A. Karlsson · B. Edén-Engström
Department of Medical Sciences, Uppsala University Hospital,
Uppsala, Sweden

M. Sundbom
Department of Surgical Sciences, Uppsala University Hospital,
Uppsala, Sweden

Patients and Methods

Participants

Ten morbidly obese patients who had undergone BPD-DS surgery (five men, five women), all Caucasians, free from established diabetes and not on pharmacological treatment for diabetes, were recruited from the Outpatient Clinic of Obesity Care, Uppsala University Hospital, Uppsala, Sweden.

These patients were recruited for a standardised test meal study separated from clinical standard follow-ups. The test meal composition used and procedures performed has previous been described [15].Test meal data from the BPD-DS group was compared with data obtained from normal-weight controls (six men, six women) [15]. The BPD-DS surgery-treated patients were considered weight-stable with an average body mass index (BMI) of 29.0±5.2 kg/m^2 (mean±SD). They had undergone surgery 26 months (median, 18–44 months range) before the test meal study. The mean pre-surgery BMI was 53.5±3.8 kg/m^2. Age and gender distribution were similar in both groups, but the contrast group of NW-controls weighted 20% less than the BPD-DS

group, BMI 23.2±2.4 kg/m^2. Basal characteristics of the participants are presented in Table 1.

Exclusion criteria for participants were liver disease, high alcohol consumption (>21 units per week, 1 unit=8 g alcohol) and use of hypoglycaemic agents or lipid-lowering medication at baseline or follow-ups. All BPD-DS patients were given the same kind of dietary advice after surgery and were recommended to take a daily oral supplement containing vitamins and minerals (Vitamineral®) which is not containing magnesium. Data from clinical investigations before BPD-DS (baseline) and at follow-up visits at 1, 2 and 3 years (1st, 2nd and 3rd follow-up, respectively) after BPD-DS surgery are shown in Table 3.

The study was approved by the regional ethics review board at Uppsala University. All patients gave written informed consent.

Table 1 Clinical characteristics in the fasting state of the meal test for morbidly obese patients, median 26 months (range, 18–44), after BPD-DS surgery and for normal-weight controls

	BPD-DS patients	Controls	*P* for difference
Gender (women/men)	5/5	6/6	–
Age (years)	39.1 (6.5)	41.1 (7.5)	0.501
BMI (kg/m^2)	29.0 (5.2)	23.2 (2.4)	0.002
Weight (kg)	87.6 (22.5)	70.9 (12.5)	0.039
Height (cm)	173.0 (12.1)	174.2 (9.6)	0.778
f-P-glucose (mmol/l)	4.2 (0.3)	4.8 (0.6)	0.007
HbA_{1c} (%)	3.9 (0.5)	4.2 (0.2)	0.800
f-P-proinsulin (pmol/l)	2.6 (1.0)	5.9 (7.4)	0.179
f-P-insulin (pmol/l)	15.2 (4.7)	19.8 (13.2)	0.005
f-P-FFA (mmol/l)	0.53 (0.22)	0.78 (0.32)	0.054
f-P-TG (mmol/l)	0.78 (0.30)	0.91 (0.65)	0.560

Data given are arithmetic means (±SD)

f fasting, *P* plasma, *FFA* free fatty acid, *TG* triglycerides, *BPD-DS* bileopancreatic diversion with duodenal switch

The standardised test meal was separated in time from ordinary follow-ups

Test Meal

The meal was composed to fit with the amount of food possible to eat due to the reduced gastric volume after bariatric surgery. Total energy content was 2,400 kJ

574 Kcal

Table 2 Postprandial test meal data for obese patients, median 26 months (range, 18–44), after BPD-DS surgery and for normal-weight controls

	Time-points					
	0min	30min	60min	90min	120min	180min
BPD-DS group						
P-glucose (mmol/l)	4.2 (0.3)	6.2 (0.9)	6.7 (0.9)	6.0 (1.3)	5.0 (1.2)	4.2 (0.5)
P-proinsulin (pmol/l)	2.6 (1.0)	11.9 (6.2)	18.0 (6.0)	20.1 (10.2)	15.7 (7.9)	8.6 (4.7)
P-insulin (pmol/l)	15.2 (4.7)	177 (136)	136 (136)	85.6 (74.3)	39.8 (15.7)	26.2 (12.1)
P-FFA (mmol/l)	0.53 (0.22)	0.45 (0.20)	0.14 (0.06)	0.08 (0.02)	0.08 (0.04)	0.23 (0.10)
P-TG (mmol/l)	0.78 (0.3)	0.76 (0.29)	0.73 (0.28)	0.69 (0.28)	0.70 (0.30)	0.69 (0.28)
NW control group						
P-glucose (mmol/l)	4.8 (0.6)	7.3 (1.0)	7.4 (1.3)	6.5 (1.0)	5.8 (0.7)	5.3 (0.7)
P-proinsulin (pmol/l)	5.9 (7.4)	17.1 (10.8)	27.8 (14.6)	29.7 (11.8)	26.3 (8.9)	19.9 (10.8)
P-insulin (pmol/l)	19.8 (13.2)	190 (91.2)	196 (97.2)	147 (67.8)	88.8 (37.8)	52.2 (38.4)
P-FFA (mmol/l)	0.78 (0.32)	0.69 (0.27)	0.38 (0.23)	0.26 (0.11)	0.29 (0.19)	0.29 (0.14)
P-TG (mmol/l)	0.91 (0.65)	0.95 (0.89)	1.03 (0.97)	1.07 (1.02)	1.07 (0.96)	1.08 (0.81)

Data given are arithmetic means (±SD)

P plasma, *FFA* free fatty acids, *TG* triglycerides, *BPD-DS* bileopancreatic diversion with duodenal switch, *NW* normal weight

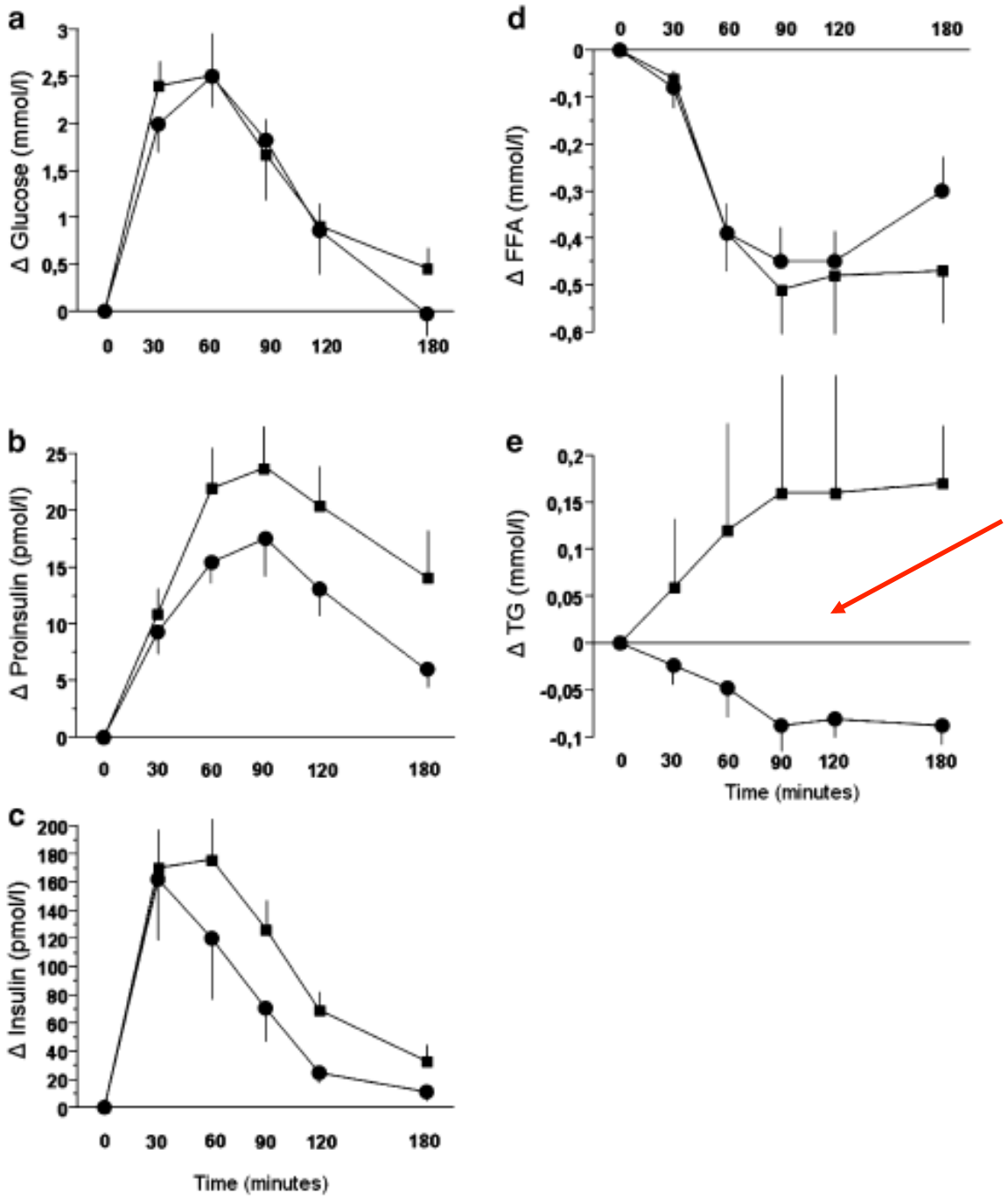
a
Δ Glucose (mmol/l)
3
2,5
2
1,5
1
0,5
0
0 30 60 90 120 180
b
Δ Proinsulin (pmol/l)
25
20
15
10
5
0
0 30 60 90 120 180
c
Δ Insulin (pmol/l)
200
180
160
140
120
100
80
60
40
20
0
0 30 60 90 120 180
Time (minutes)
d
Δ FFA (mmol/l)
0 30 60 90 120 180
0
-0,1
-0,2
-0,3
-0,4
-0,5
-0,6
e
Δ TG (mmol/l)
0,2
0,15
0,1
0,05
0
-0,05
-0,1
0 30 60 90 120 180
Time (minutes)

Fig. 1 a–e The postprandial changes in glucose (**a**), proinsulin (**b**), insulin (**c**), free fatty acid (FFA; **d**) and triglyceride (TG; **e**) concentrations are shown for 180 min after the ingestion of the standardised test meal (mean±SEM). *Filled circle*, morbidly obese subjects treated with bileopancreatic diversion with duodenal switch (BPD-DS) surgery; *filled square*, NW-controls. *Glucose*: In both groups, similar increase in glucose concentrations were observed in the early phase (30–60 min) and with a similar decrease in intermediate phase (60–120 min) and the late phase (120–180 min; p=0.976–0.136). *Proinsulin*: In early phase, proinsulin concentrations were equally increased in both groups but to a higher peak in the NW-controls. In the intermediate and late phase, concentrations of plasma proinsulin were lowered in a parallel manner in both groups with lower absolute values in the BPD-DS group (p=0.606–0.097). *Insulin*: The postprandial changes were similar in both groups, but in the NW-controls, increased to a higher peak in the early phase. In the intermediate and late phases, insulin response was declining in a similar pattern but separated from each other and significantly lower in BPD-DS group at 120 min (p=0.0079). *Free Fatty Acids*: During the test meal, FFA were suppressed in a similar manner in both groups. No differences were observed regarding postprandial changes (p= 0.969–0.209). *Triglycerides*: Regarding postprandial changes in the BPD-DS group compared with NW-control subjects, a trend for lower TG concentrations were observed in the intermediate phase (p=0.07–0.08), and they were significantly lowered in the late phase at 180 min (p=0.002)

Table 3 Clinical characteristics for patients before BPD-DS surgery and at follow-ups 1, 2 and 3 years after surgery

	0	1year	2year	3year	*P* for trend
Gender (women/men)	5/5	5/5	5/5	5/5	–
Age (years)	37.5	–	–	–	–
BMI (kg/m^2)	53.5 (3.8)	30.7 (4.6)	28.4 (3.8)	30.2 (5.0)	<0.001
Weight (kg)	161.3 (26.7)	92.9 (21.4)	86.0 (19.4)	91.9 (25.8)	<0.001
Height (cm)	173.0 (10.1)	173.4 (10.7)	173.3 (10.6)	173.4 (10.7)	0.999
f-P-glucose (mmol/l)	5.5 (0.9)	4.6 (0.58)	4.5 (0.35)	4.6 (0.22)	<0.001
HbA_{1c} %	4.9 (0.39)	3.8 (0.28)	4.1 (0.45)	4.0 (0.29)	<0.001
P-ALT(μkatal/l)	0.79 (0.39)	0.43 (0.18)	0.36 (0.16)	0.41 (0.13)	0.001
P-creatinine (mmol/l)	85.6 (9.7)	68.8 (10.7)	58.9 (9.6)	55.4 (8.8)	<0.001
P-albumin (mmol/l)	40.4 (2.3)	38.9 (4.5)	39.8 (3.9)	39.3 (3.2)	0.322
P-uric acid (μmol/l)	411 (82)	266 (52)	233 (70)	209 (64)	<0.001
P-magnesium (mmol/l)	0.79 (0.10)	0.80 (0.07)	0.89 (0.07)	0.88 (0.06)	0.017
P-calcium (mmol/l)	2.30 (0.05)	2.26 (0.09)	2.18 (0.12)	2.20 (0.10)	0.058
P-sodium (mmol/l)	141 (3.5)	136 (4.9)	139 (0.6)	140 (2.1)	0.231
P-potassium (mmol/l)	3.8 (0.25)	3.4 (0.09)	3.6 (0.29)	3.7 (0.44)	0.106
f-P-total cholesterol (mmol/l)	5.0 (0.45)	3.38 (0.28)	3.38 (0.47)	3.20 (0.43)	<0.001
f-P-LDL-C (mmol/l)	3.18 (0.41)	1.96 (0.30)	1.99 (0.35)	1.93 (0.35)	<0.001
f-P-HDL-C (mmol/l)	1.07 (0.14)	1.10 (0.20)	1.13 (0.22)	0.98 (0.16)	0.316
f-P-LDL/HDL-C ratio	3.03 (0.61)	1.85 (0.58)	1.83 (0.58)	1.99 (0.56)	<0.001
f-P-TG (mmol/l)	1.74 (0.63)	0.92 (0.19)	0.93 (0.48)	0.90 (0.31)	<0.001

Data given are arithmetic means (±SD)

ALT alanine aminotransferase, *LDC-C* low-density lipoprotein cholesterol, *HDL-C* high-density lipoprotein cholesterol, *TG* triglycerides, *f* fasting, *P* plasma

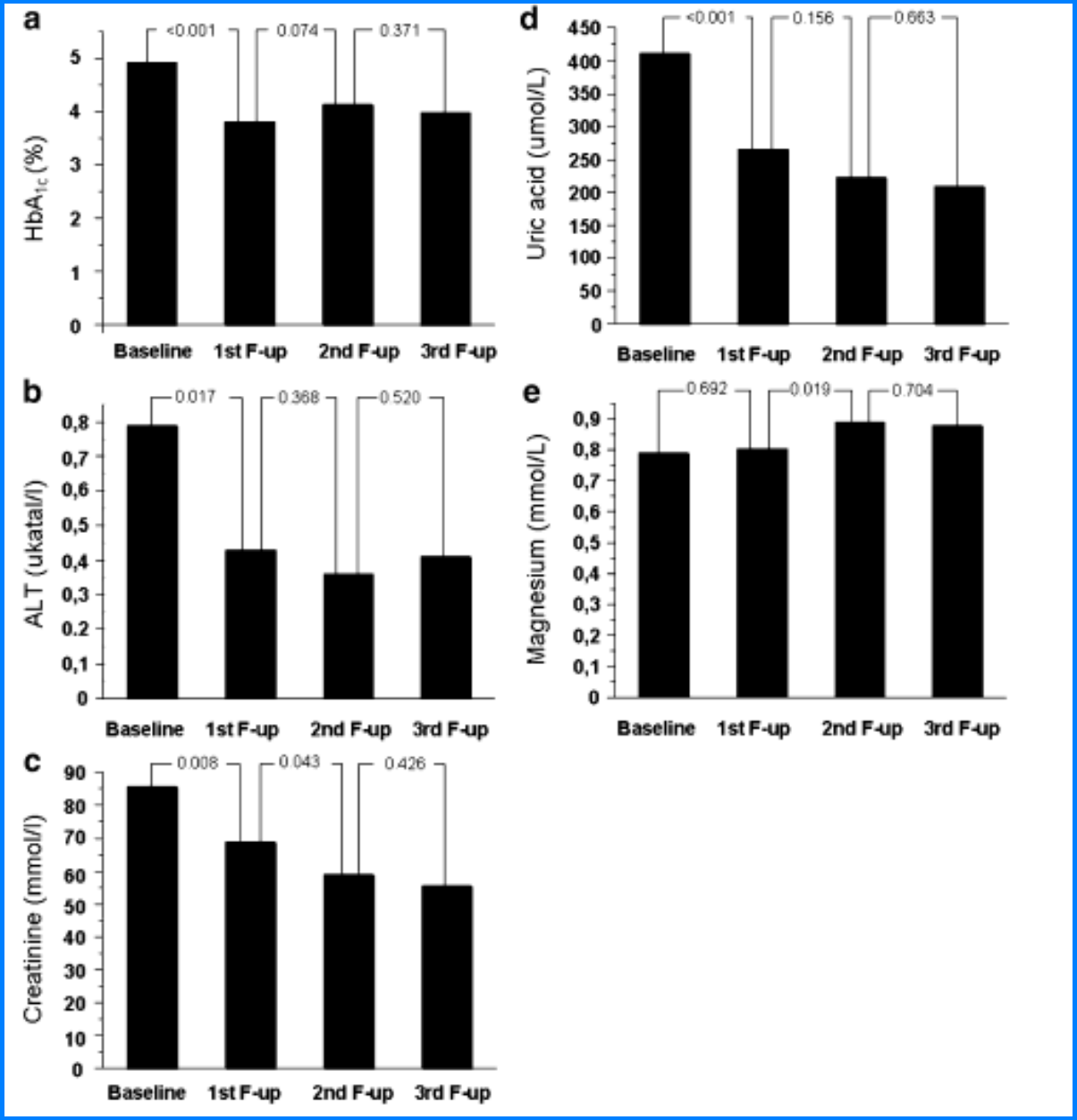

Fig. 2 a–e The changes in HbA1c (**a**) and concentrations of alanine aminotransferase, *ALT* (**b**), creatinine (**c**), uric acid (**d**) and magnesium (**e**) are shown at baseline, at first follow-up (1 year), at second follow-up (2 years) and at third follow-up (3 years) after bileopancreatic diversion with duodenal switch. Mean values are shown. Statistical significance is presented as *p* values. *F-up* denotes follow-up

The plasma creatinine concentrations decreased markedly during the 3-year follow-up period after BPD-DS, suggesting a loss of muscular mass, possible more prominent than previously reported 1 year after RYGBP-surgery [41]. Already 6 month after RYGBP-surgery a body composition study showed that one fifth of weight loss was due to possible muscle mass loss [42]. BPD-DS induce greater weight loss than RYGBP with possible larger impact on muscular mass loss and thus more prominent reduction of creatinine. Measurements of body composition after BPD-DS is warranted as well as more precise analyses of renal function as this may have clinical implications. Renal function is usually estimated by serum creatinine measurements in clinical praxis and early signs of renal function abnormalities may go undetected after BPS-DS. The increased serum magnesium concentrations after BPD-DS are congruent with our previous report on magnesium status after RYGBP-surgery, reflecting the association of reduced obesity and lowered plasma glucose with increased circulating magnesium concentrations.

- Para explicar este hecho se ha implicado a los cambios enterohormonales, sobre todo aumento de GLP-1 y PYY postprandiales, que se producen tras la cirugía.
- En el caso de BPD-DS, además, con malabsorción de TG.

- Con la cirugía metabólica, en la que se realizaría una exclusión duodenoyeyunal, se pretende la llegada de alimentos al ileon tras su paso por la cavidad gástrica.
- Se produciría una pequeña pérdida de peso en estos pacientes con sobrepeso u obesidad grado 1, y un aumento de GLP-1 y PYY sobre todo postprandialmente, con lo cual aumentaría la secreción de insulina en respuesta a los alimentos, disminuiría la insulinorresistencia, disminuiría el glucagón y posiblemente habría una mejoría en el componente celular beta pancreático con aumento de la neogénesis y disminución de la apoptosis.

PREGUNTAS QUE SE HACE UN ENDOCRINÓLOGO

- ¿A QUIÉN SE PODRÍA OPERAR?
- ES DECIR:
- ¿QUIÉN PODRÍA BENEFIARSE?

PREGUNTAS QUE SE HACE UN ENDOCRINÓLOGO

- ¿A QUIÉN SE PODRÍA PERJUDICAR?
- ES DECIR:
- ¿PODRÍA SER REVERSIBLE EN EL CASO DE QUE SE VEAN EFECTOS COLATERALES?

PREGUNTAS QUE SE HACE UN ENDOCRINÓLOGO

- ¿CÓMO SE PODRÍA PLANTEAR?
- ES DECIR:
- ¿CUÁLES SON LAS CONDICIONES DE ENSAYO Y DE ANÁLISIS DE LOS RESULTADOS?

PREGUNTAS QUE SE HACE UN ENDOCRINÓLOGO

- POR LO TANTO:

- ¿A QUIÉN SE LO PODREMOS OFRECER SIN HACERLE DAÑO?
- ¿CÓMO SELECCIONAMOS LA TÉCNICA ADECUADA A CADA CASO?
- CONSIDERACIONES ÉTICAS.

- PRESENTE DE LA CM: EL EJEMPLO DE BRASIL.

- FUTURO DE LA CM: LA BÚSQUEDA DEL EQUILIBRIO.

ASMBS American Society for Metabolic & Bariatric Surgery

CONTACT: Keith Taylor
(212) 527-7537

FOR IMMEDIATE RELEASE

GROWING CONSENSUS FOR 'DIABETES SURGERY'

International Task Force Endorses Diabetes Surgery for Morbidly Obese Patients, Strongly Calls for Research into Use of Surgery in Non-Obese to Stem Diabetes Epidemic

GAINESVILLE, FL – November 23, 2009 – With a diabetes and obesity epidemic spiraling out of control and a growing amount of research on the topic, an international group of 50 scientific and medical experts joined the chorus of medical societies endorsing diabetes surgery to treat type 2 diabetes in morbidly obese patients, but went further in saying the surgery may also be appropriate to treat diabetes in the mildly to moderately obese population.

In its position statement, the Diabetes Surgery Summit says "surgery should be considered for the treatment of type 2 diabetes" in patients with a body mass index (BMI) of 35 kg/m² or more "who are inadequately controlled by lifestyle and medical therapy." People with a BMI of 35 kg/m² or more are typically at least 75 to 80 pounds overweight and have medical condition known as morbid obesity.

The statement also went on to say that diabetes surgery may also be appropriate for treatment of people with mild to moderate obesity (BMI 30-35 kg/m^2), which goes beyond parameters established by the National Institutes of Health (NIH) for bariatric surgery in 1991. In its recommendations, the NIH limited bariatric surgery to people with a BMI of 35 kg/m^2 or more and an obesity-related condition or a BMI of 40 kg/m^2 or more with or without an obesity-related condition. Almost 20 years later, these parameters are still adhered to by most insurance companies in determining coverage of the surgery.

"The science of diabetes, obesity and surgery has significantly advanced since 1991, and the evidence suggests that a precise BMI cut off of 35 is not a good predictor of whether or not surgery will induce diabetes remission or improvement," said Phillip R. Schauer, MD, one of the authors of the position statement and Professor of Surgery at the Cleveland Clinic Lerner College of Medicine and Director of the Cleveland Clinic Bariatric and Metabolic Institute. "The evidence isn't there yet to say surgery should be performed on non-obese patients with diabetes, but there is new evidence to suggest that certain procedures can work for people with lower BMIs, with low rates of complications and mortality in the short- to mid-term."

The ASMBS is the largest organization for bariatric surgeons in the world. It is a non-profit organization that works to advance the art and science of bariatric surgery and is committed to educating medical professionals and the lay public about bariatric surgery as an option for the treatment of morbid obesity, as well as the associated risks and benefits. It encourages its members to investigate and discover new advances in bariatric surgery, while maintaining a steady exchange of experiences and ideas that may lead to improved surgical outcomes for morbidly obese patients. For more information about the ASMBS, visit www.asmbs.org. To view the Consensus please visit http://www.asmbs.org/Newsite07/resources/DSS_Consensus%20_Annals_Final.pdf

Annals of Surgery 2009
Diabetes 2009

ORIGINAL ARTICLES

The Diabetes Surgery Summit Consensus Conference

Recommendations for the Evaluation and Use of Gastrointestinal Surgery to Treat Type 2 Diabetes Mellitus

Francesco Rubino, MD,† Lee M. Kaplan, MD, PhD,‡ Philip R. Schauer, MD,§ and David E. Cummings, MD,¶ On Behalf of the Diabetes Surgery Summit Delegates*

TABLE 2. Scientific Organizations That Endorsed the Diabetes Surgery Summit

ADA	American Diabetes Association
ASMBS*	American Society for Metabolic and Bariatric Surgery
ACS	American College of Surgeons
ACN	American College of Nutrition
AGA	American Gastroenterological Association
ASN	American Society for Nutrition
ASO	Association for the Study of Obesity
ASPEN	American Society for Parenteral and Enteral Nutrition
Diabetes UK*	Diabetes United Kingdom
EAES	European Association for Endoscopic Surgery
EASD	European Association for the Study of Diabetes
EASO	European Association for the Study of Obesity
IASO*	International Association for the Study of Obesity
IFSO*	International Federation for the Surgery of Obesity and Metabolic diseases
TOS*	(formerly NAASO)-The Obesity Society
SAGES	Society of American Gastrointestinal and Endoscopic Surgeons
SAH	Shaping America's Health
SIC	Societa′ Italiana di Chirurgia (Italian Society of Surgery)
SICOB	Societa′ Italiana di Chirurgia dell'Obesita′ e delle Malattie Metaboliche
SID	Societa′ Italiana Diabetologia (Italian Society of Diabetology)
SSAT	Society for Surgery of the Alimentary Tract

*Indicates societies that in addition to endorsing the concept and methods of the DSS have also officially endorsed the final DSS position statement at the time of this writing.

Participants in the Summit and Selection Criteria for Voting Delegates

Participants were chosen to represent a diversity of medical and surgical disciplines, major scientific societies, and leading journals. Four major groups of thought leaders were represented among the DSS delegates who voted on consensus statements: (1) endocrinologists and gastroenterologists with relevant scholarship; (2) diabetologists with specific expertise in pertinent research methods; (3) surgeons with relevant scholarship and experience; and (4) basic science investigators working in this area. Additional voting delegates included experts in epidemiology, health economics and clinical trial design, as well as representatives of pertinent societies and journals.

TABLE 4. International Diabetes Surgery Task Force Members

Member	Affiliation, Country
Sir George Alberti	Imperial College of London, UK
Stephanie Amiel	Kings Cross College, London, UK
Steven H. Belle	University of Pittsburgh, USA
David E. Cummings	University of Washington, USA
John Dixon	Monash University, Australia
Bob H. Eckel	University of Colorado Denver, USA
Ele Ferrannini	University of Pisa, Italy
David R. Flum	University of Washington, USA
Lee M. Kaplan	Harvard Medical School, USA
Francine R. Kaufman	Keck School of Medicine-USC, USA
Sam Klein	Washington University, St. Louis, USA
Carel LeRoux	Imperial College, London, UK
Walter J. Pories	East Carolina University, USA
John Q. Purnell	Oregon Health and Science Institute, USA
Eric Ravussin	Pennington Institute, USA
Bob A. Rizza	Mayo Clinic, USA
Francesco Rubino	Weill Cornell Medical College, New York, USA
Philip R. Schauer	Cleveland Clinic, USA
Lars Sjostrom	University Hospital Gothenburg, Sweden
Paul Zimmet	Baker-IDI Institute, Australia

TABLE 3. Position Statement From the Diabetes Surgery Summit

GI surgery (ie, RYGB, LAGB, or BPD) should be considered for the treatment of T2DM in acceptable surgical candidates with BMI ≥35 kg/m^2 who are inadequately controlled by lifestyle and medical therapy (A).* A surgical approach may also be appropriate as a non-primary alternative to treat inadequately controlled T2DM in suitable surgical candidates with mild-to-moderate obesity (BMI 30–35 kg/m^2) (B). RYGB may be an appropriate surgical option for diabetes treatment in this patient population (C).

Although novel GI surgical techniques (eg, duodenal-jejunal bypass, ileal interposition, sleeve gastrectomy, endoluminal sleeves) show promising results for the treatment of T2DM in early clinical studies, they should currently be used only in the context of IRB-approved and registered trials (A).

To improve quality of medical evidence, the development of standards for measuring clinical and physiological outcomes of surgical treatment for T2DM is a high priority (A).

Randomized controlled trials are strongly encouraged to assess the utility of GI surgery to treat T2DM (A). In patients with BMI <35 kg/m^2, determining the appropriate use of GI surgery for the treatment of T2DM is an important research priority (A). Controlled clinical trials in these patients should be performed to determine the safety and efficacy of GI metabolic surgery (A) as well as to identify parameters other than BMI as criteria for appropriate patient selection (A). Development of a standard registry/database is a high priority for research in this area (A). In addition to clinical trials, animal studies can provide useful information about the efficacy and mechanisms of GI metabolic surgery to treat T2DM (A).

The study of GI metabolic surgery provides valuable, new opportunities for investigating contributions of the GI tract to glucose homeostasis and the pathophysiological mechanisms of T2DM (A). Available data from animal and clinical studies suggest that weight loss alone explains diabetes control after LAGB (A). In contrast, intestinal bypass procedures such as RYGB, BPD, and duodenal-jejunal bypass appear to engage additional anti-diabetes mechanisms beyond those related to reduced food intake and body weight (A). Furthermore, anatomic modifications of various regions of the GI tract ameliorate T2DM through distinct physiological mechanisms (B). Collaboration among endocrinologists, surgeons, and basic scientists should be encouraged to facilitate greater understanding of GI mechanisms of metabolic regulation and to allow use of these insights to improve the treatment of T2DM (A).

The establishment of a multidisciplinary taskforce to guide the study and development of diabetes surgery is a high priority. This taskforce should include endocrinologists, surgeons, clinical and basic investigators, and bioethicists, among others (A).

*Capital letters in parentheses indicate the levels of consensus for individual statements, defined as follows: "Grade C" (67%–77% agreement), "Grade B" (78–89% agreement), and "Grade A" (90%–100% agreement).

CONCLUSIONS

The DSS recognizes a valuable role for GI surgery in the treatment of T2DM in patients with severe obesity (BMI >35 kg/m^2) as well as in carefully selected, moderately obese patients (BMI: 30–35 kg/m^2) who are inadequately controlled by conventional medical and behavioral therapies. Based on available evidence, the DSS recommends that conventional and novel GI procedures in nonobese patients be performed at this time only in clinical trials with IRB approval. Further clinical investigations designed to identify new and more appropriate parameters for surgical indications and the appropriate role of surgery in less obese or overweight patients should be considered an important research priority. Finally, the DSS strongly encourages research into the mechanisms of action in GI metabolic surgery, as this represents an extraordinary opportunity to advance the understanding of diabetes pathophysiology and ultimately improve the treatment of this disease.

PREGUNTA ?

- ¿CUÁL ES EL MOMENTO EVOLUTIVO IDEAL EN LA HISTORIA NATURAL DE LA DIABETES PARA INDICAR LA CIRUGÍA METABÓLICA?

XIX Congreso SONUDIGA

V Curso Básico de Nutrición Clínica

XIX Jornadas de Nutrición Clínica para Enfermería y Dietética

Pontevedra, 23 y 24 abril 2010