DIABETES
HSJD | Dr. Manuel García de los Rios A.

Octubre 2025

Cáncer y Diabetes

“ Una mirada desde la prevención a las complicaciones”

Dr. Gonzalo Galván Escobar

Medicina Interna

Nutrición Clínica y Diabetes

Hoja de Ruta

- Introducción
- Datos epidemiológicos : asociación entre Cáncer y Diabetes, implicancias
- Potenciales mecanismos asociados entre Diabetes y Cáncer
- Tratamientos del Cáncer y riesgo de Diabetes
- Generalidades del tratamiento de la Diabetes en Cáncer.
- Conclusión

Introducción

- La **diabetes y el cáncer** son dos patologías que han ido aumentando en el tiempo con un importante **impacto en la salud pública**.

- Múltiples estudios epidemiológicos muestran una **mayor mortalidad en paciente con DM2 y cáncer**.

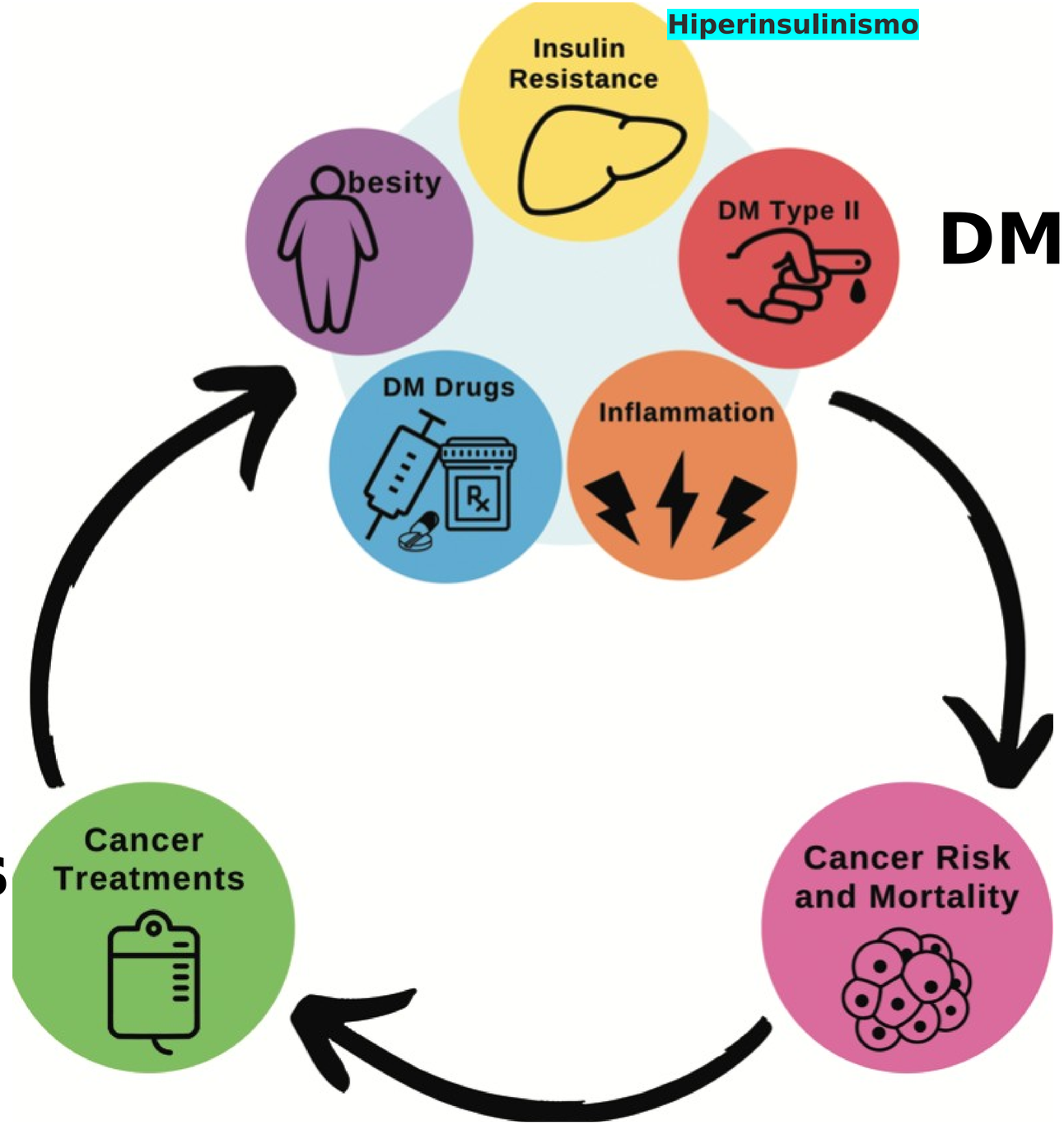
- Los pacientes con diabetes muestran un **curso neoplásico más agresivo**.

- Una optimización del control metabólico es crucial, ya que **previene retrasos** en procedimientos diagnósticos (ej. PET), **reduce las suspensiones** de quimioterapia (QMT)→ mejora el pronóstico.

- Abordar estas patologías de manera efectiva exige un paradigma de **manejo integral e interdisciplinario** → mejorar outcomes y calidad de vida (QoL).

ESMO Open, December 2023 , Volume 8, Issue 6

Hiperinsulinismo



DM2

Tratamientos Cáncer

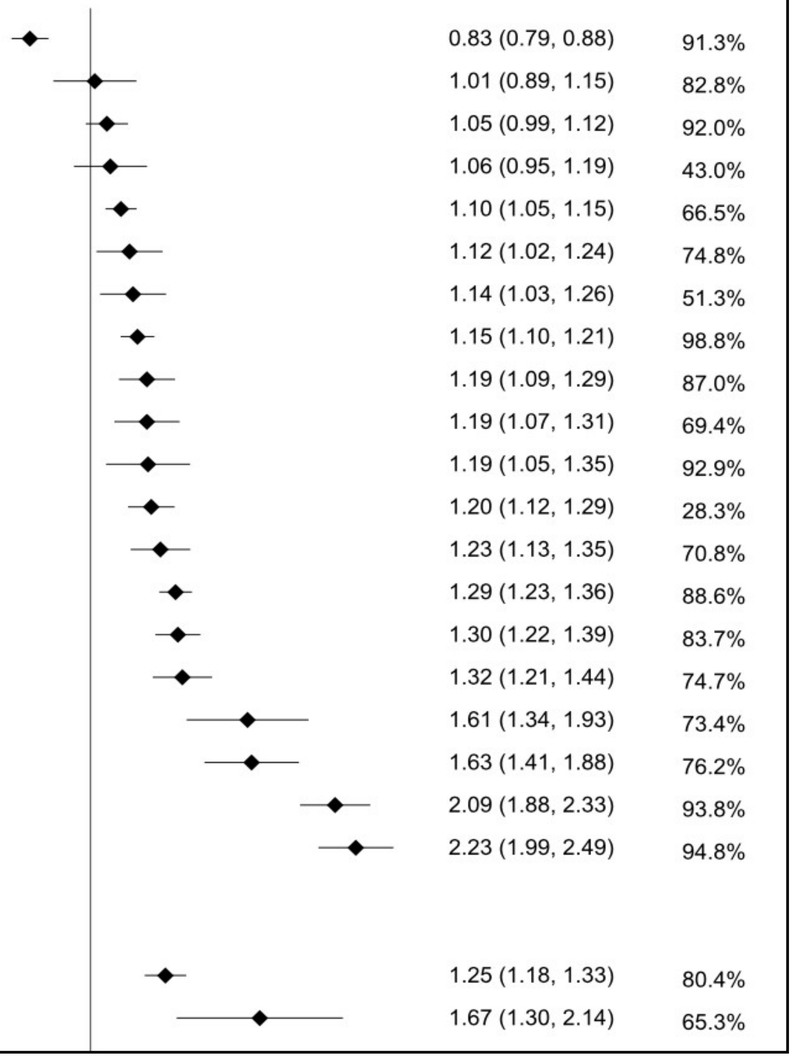
Cáncer

Endocrine Reviews 41: 33 – 52, 2020

Asociación de Diabetes y Cáncer

Diabetes y Cáncer

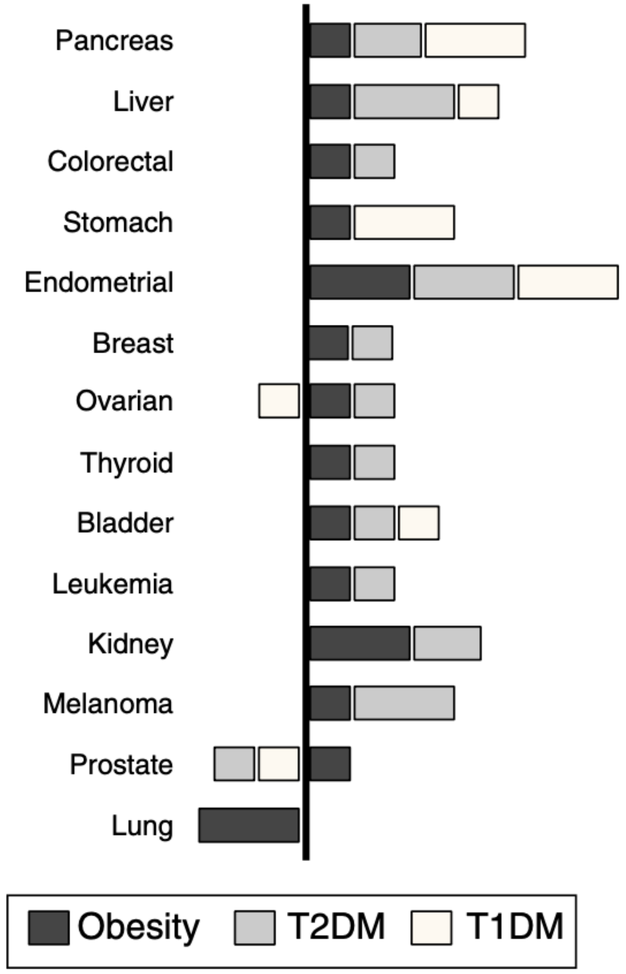
	Number of				
Incidence	Cohorts	Total Events	Total Participants	RR (95% CI)	I^2
Prostate	39	187,279	13,982,425	0.83 (0.79, 0.88)	91.3%
Esophagus	19	18,497	12,140,419	1.01 (0.89, 1.15)	82.8%
Lung	32	154,787	16,149,760	1.05 (0.99, 1.12)	92.0%
Melanoma	11	7,994	8,816,261	1.06 (0.95, 1.19)	43.0%
Breast	32	55,858	8,361,221	1.10 (1.05, 1.15)	66.5%
NHL	19	19,637	12,554,832	1.12 (1.02, 1.24)	74.8%
Ovary	20	4,768	7,037,739	1.14 (1.03, 1.26)	51.3%
All-site	30	816,630	15,498,790	1.15 (1.10, 1.21)	98.8%
Bladder	30	43,092	15,869,950	1.19 (1.09, 1.29)	87.0%
Leukemia	12	15,774	11,441,697	1.19 (1.07, 1.31)	69.4%
Stomach	28	22,172	14,443,780	1.19 (1.05, 1.35)	92.9%
Thyroid	14	5,316	12,942,538	1.20 (1.12, 1.29)	28.3%
Rectum	24	25,448	9,106,528	1.23 (1.13, 1.35)	70.8%
Colorectal	47	104,351	18,416,872	1.29 (1.23, 1.36)	88.6%
Colon	24	48,923	9,128,887	1.30 (1.22, 1.39)	83.7%
Kidney	23	18,722	13,169,811	1.32 (1.21, 1.44)	74.7%
Gallbladder	17	4,404	12,738,195	1.61 (1.34, 1.93)	73.4%
Endometrium	15	6,260	3,147,440	1.63 (1.41, 1.88)	76.2%
Pancreas	38	32,713	23,595,620	2.09 (1.88, 2.33)	93.8%
Liver	36	41,464	16,760,921	2.23 (1.99, 2.49)	94.8%
Mortality					
All-site	17	147,480	3,500,363	1.25 (1.18, 1.33)	80.4%
Pancreas	11	5,082	3,487,609	1.67 (1.30, 2.14)	65.3%



Diabetes Care 2020;43:2313–2322

Cáncer, Diabetes y Obesidad

(A)

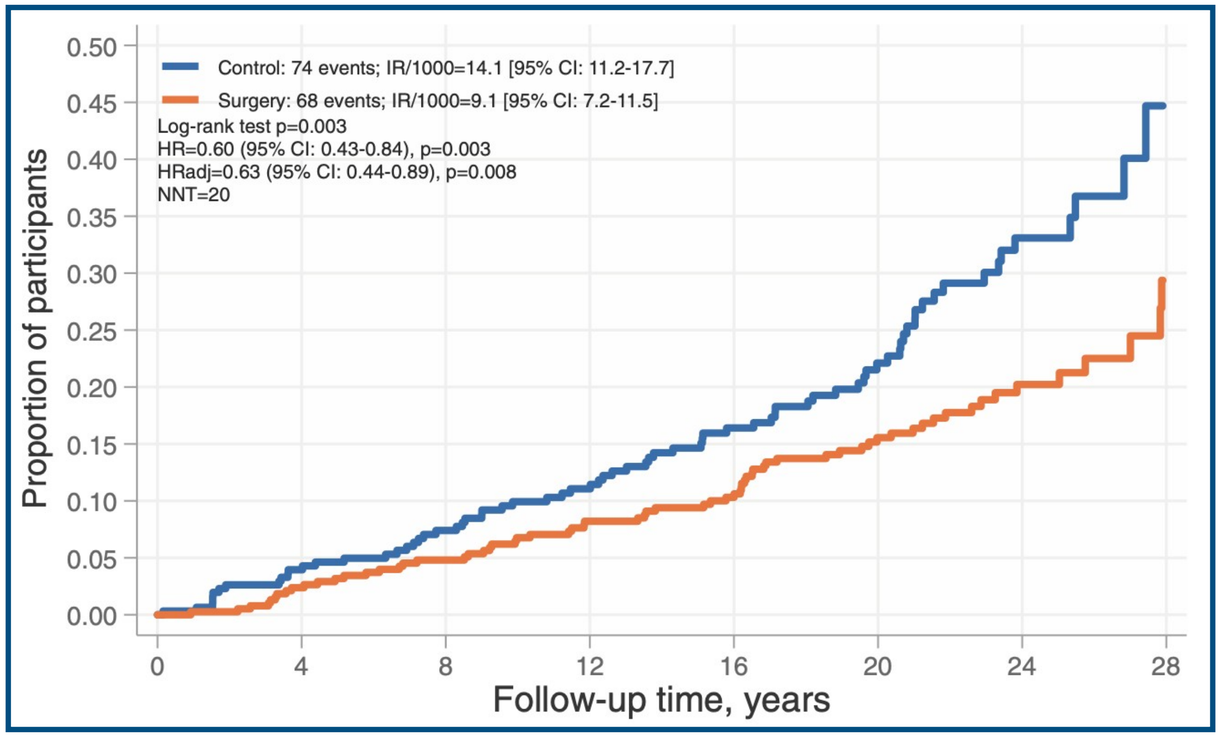


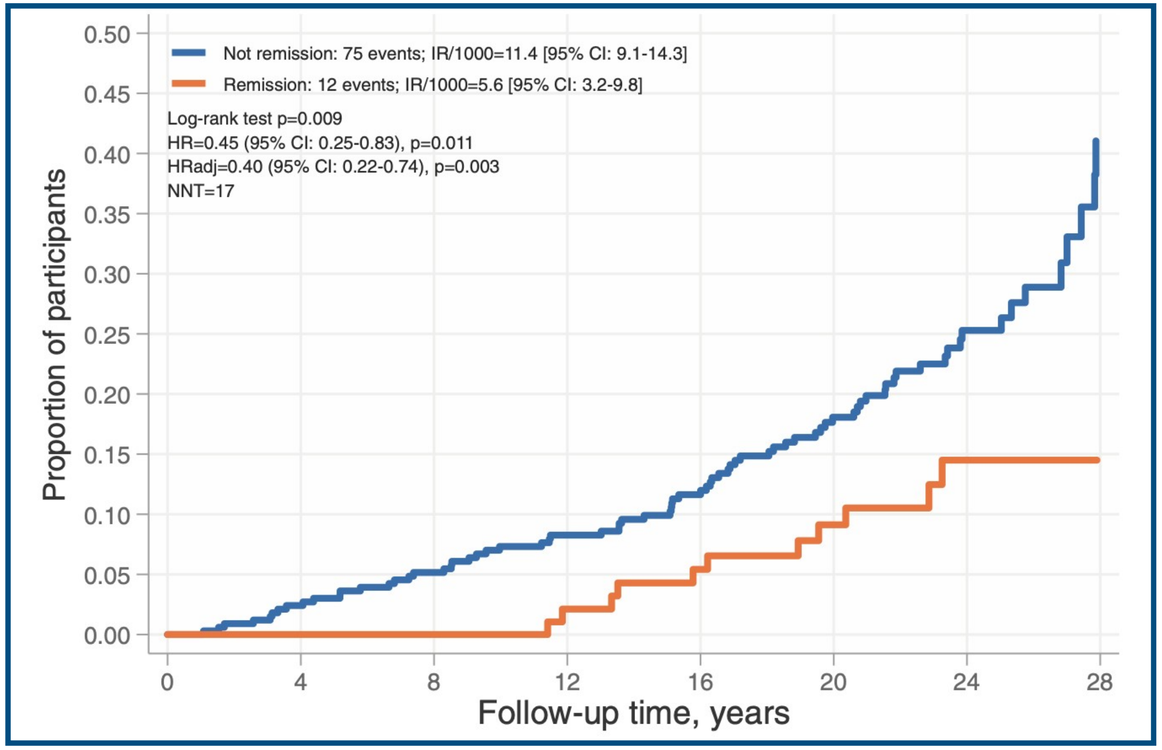
(B)

Obesity	T2DM	T1DM
RR (95% CI) [Ref.]	RR (95% CI) [Ref.]	RR (95% CI) [Ref.]
1.48 (1.15 – 1.92) [8]	1.95 (1.66 – 2.28) [20]	2.00 (1.37 – 3.01) [24]
1.35 (1.24 – 1.47) [9]	2.31 (1.87 – 2.84) [20]	1.59 (0.30 –4.71) [25]
1.32 (1.18 – 1.48) [10]	1.27 (1.21 – 1.34) [20]	1.10 (0.60 – 1.70) [24]
1.13 (1.03 – 1.24) [16]	1.09 (0.98 – 1.22) [20]	2.30 (1.10 – 4.10) [24]
2.54 (2.11 – 3.06) [6]	1.97 (1.71 – 2.27) [20]	2.70 (1.40 – 4.70) [24]
1.42 (1.30 – 1.45) [11]	1.20 (1.12 – 1.28) [20]	1.00 (0.80 – 1.30) [24]
1.30 (1.10 – 1.50) [12]	1.17 (1.02 – 1.34) [20]	0.80 (0.40 – 1.50) [24]
1.29 (1.18 – 1.41) [13]	1.16 (0.97 – 1.39) [20]	1.20 (0.60 – 2.20) [24]
1.10 (1.06 – 1.42) [14]	1.35 (1.17 – 1.56) [20]	1.60 (0.70 – 3.10) [24]
1.26 (1.17 – 1.37) [19]	1.28 (1.05 – 1.57) [20]	1.30 (0.70 – 2.20) [24]
1.77 (1.68 – 1.87) [7]	1.38 (1.10 – 1.72) [20]	0.80 (0.20 – 2.10) [24]
1.31 (1.19 – 1.44) [19]	2,16(1.14 – 4.35) [23]	0.80 (0.50 – 1.10) [24]
1.16 (1.08 – 1.24) [15]	0.96(0.74 – 1.26) [23]	0.33 (0.01 – 1.89) [25]
0.79 (0.73 – 0.85) [22]	1.03 (0.94 – 1.13) [20]	1.10 (0.50 – 1.90) [24]

Endocrinol Diabetes Nutr. 2017;**64(2)**:109-117

Cirugía Bariátrica en DM2 y Cáncer



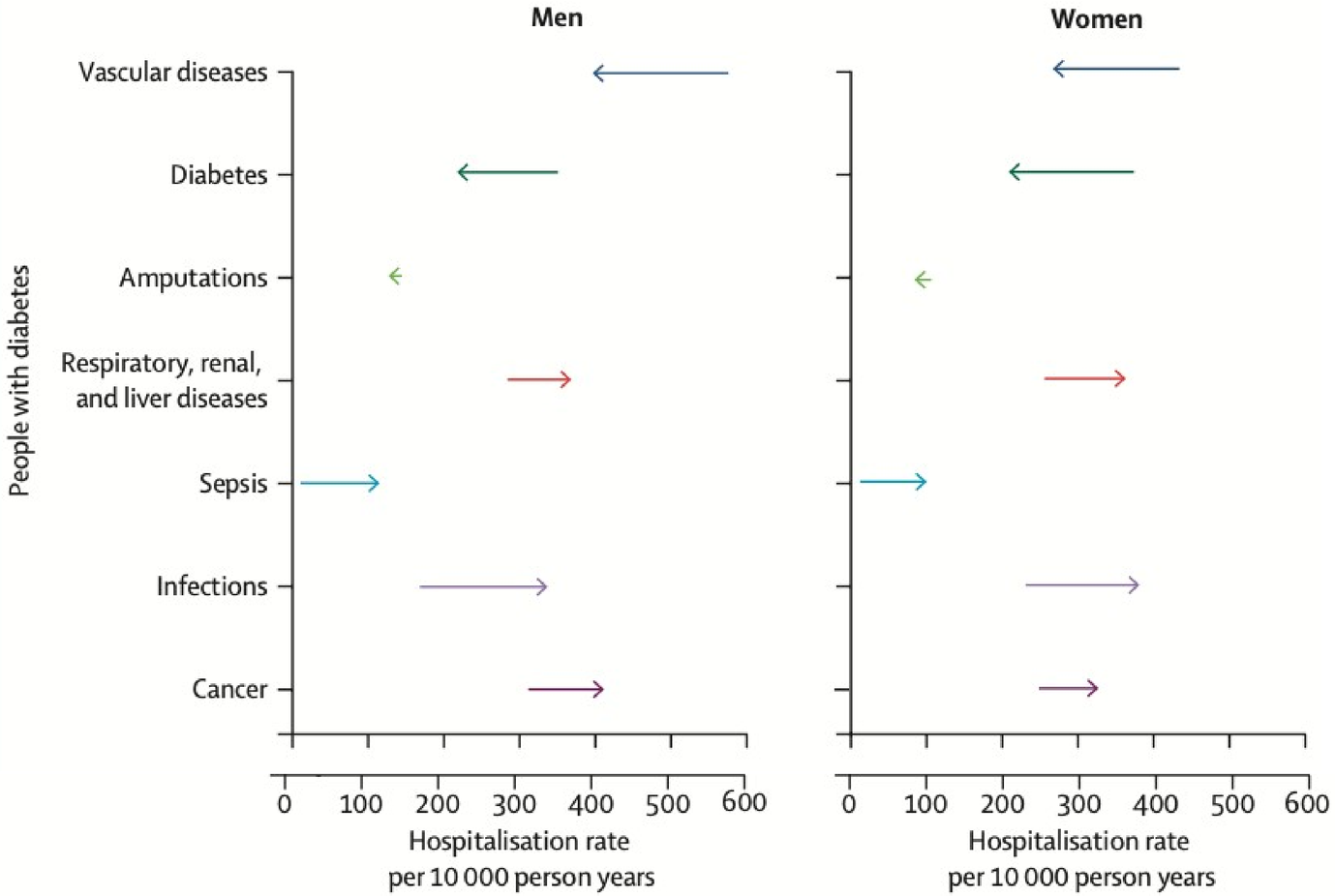


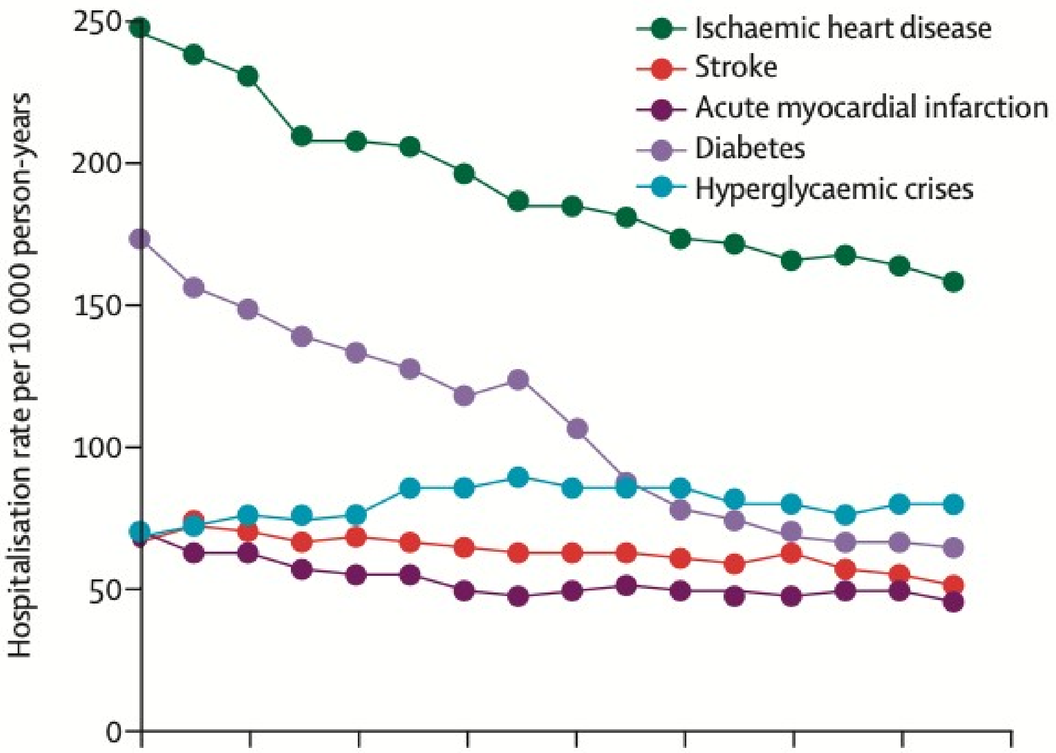
Diabetes Care 2022;45:444–450

Cambio en el perfil de complicaciones en DM2

Hospitalizaciones en DM2

Cohorte de Inglaterra 2003 al 2018





Lancet Diabetes Endocrinol 2021
Published online Nov 2021: https://doi.org/10.1016/ S2213-8587(21)002

Causas de muerte DM2

Cohorte de Escocia 2009 y 2014

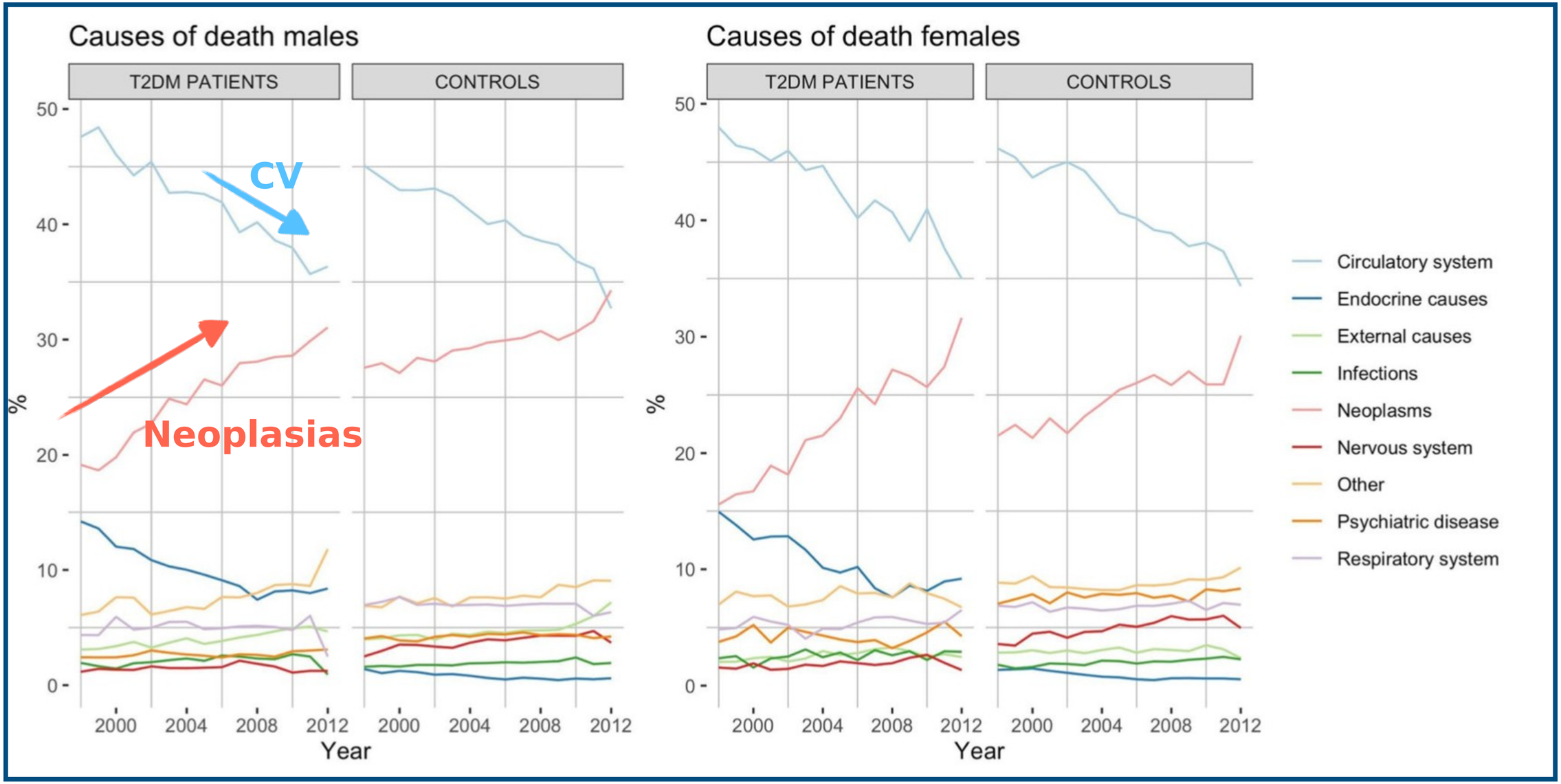
Table 2 | Cause of death for patients with type 2 diabetes by sex

Cause of death	Men	Women	Total
Cancer	29.6% (342)	25.6% (246)	27.8% (588)
Heart disease	25.7% (297)	22.1% (212)	24.1% (509)
Respiratory	12.4% (143)	13.8% (133)	13.0% (276)
Stroke	7.6% (88)	9.6% (92)	8.5% (180)
Sepsis	5.0% (58)	7.0% (67)	5.9% (125)
Decompensated diabetes	4.2% (48)	4.7% (45)	4.4% (93)
Mental health	3.1% (36)	5.1% (49)	4.0% (85)
Renal failure	2.3% (27)	2.8% (27)	2.6% (54)
Accident/liver/neurological/other	10.0% (116)	9.4% (90)	9.7% (206)
Total	1,155	961	2,116

J Diabetes Investig 2020; 11: 55–61

Causas de muerte DM2

Cohorte Sueca 1998-2012



Scientific Reports Nature. (2020) 10:17376

Importancia

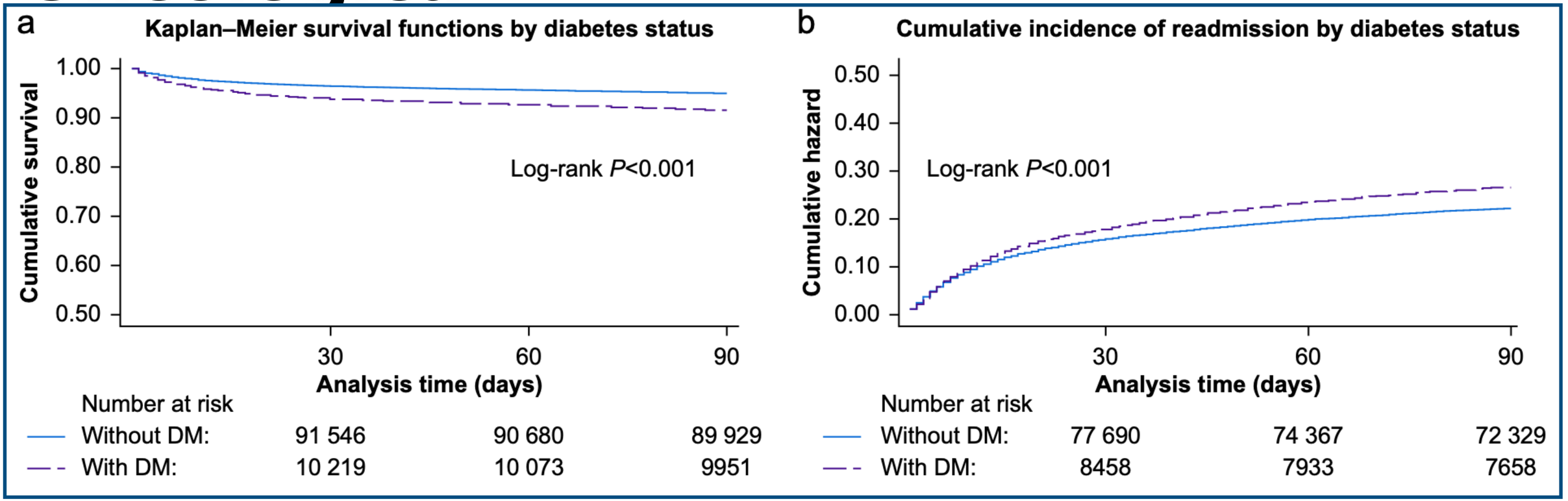
Peor sobrevida con DM2

	No diabetes					Type 2 diabetes					Adjusted relative mortality	
Cancer site	Cases	Deaths	*n*/PKPY	Mean (95% CI), years	Median (SE), years	Cases	Deaths	*n*/PKPY	Mean (95% CI), years	Median (SE), years	HR (95% CI)	*P*
Overall	104,016	42,602	120.7	9.5 (9.4–9.5)	7.1 (0.9)	8,392	3,780	171.5	7.0 (6.7–7.3)	4.6 (0.1)	1.24 (1.20–1.29)	<0.001
Bladder	5,968	2,287	102.5	9.4 (9.1–9.7)	7.8 (0.3)	675	268	113.4	8.3 (7.5–9.1)	6.2 (0.4)	1.16 (1.02–1.32)	0.027
Breast	24,393	4,796	38.8	14.3 (14.1–14.4)	19.6 (0.4)	1,182	328	76.9	10.4 (9.5–11.3)	9.4 (0.8)	1.32 (1.17–1.49)	<0.001
Colorectal	13,388	5,742	136.8	8.6 (8.4–8.8)	5.5 (0.2)	1,285	532	147.5	7.3 (6.6–8)	5.1 (0.3)	1.00 (0.91–1.10)	0.992
Liver	1,217	876	742.0	2.4 (2.0–2.8)	0.5 (0.0)	243	163	661.0	2.4 (1.5–3.2)	0.7 (0.1)	0.88 (0.74–1.05)	0.157
Lung	11,611	8,916	870.9	1.8 (1.7–1.9)	0.5 (0.0)	856	595	689.2	2.2 (1.8–2.6)	0.7 (0.0)	0.84 (0.77–0.92)	<0.001
Ovary/endometrium	4,732	1,832	111.9	9.9 (9.6–10.3)	7.9 (0.5)	394	136	112.7	8.6 (7.3–9.8)	8.4 (0.9)	0.87 (0.72–1.04)	0.120
Pancreas	1,944	1,532	1,343.6	1.2 (1–1.4)	0.3 (0.0)	364	288	1,184.1	1.1 (0.8–1.3)	0.3 (0.0)	0.98 (0.86–1.12)	0.764
Prostate	15,256	4,894	89.3	9.1 (8.8–9.3)	7.9 (0.1)	1,385	465	105.5	7.5 (6.9–8.0)	6.7 (0.2)	1.19 (1.08–1.31)	0.001
Other	25,507	11,727	143.8	8.6 (8.4–8.7)	5.2 (0.2)	2,008	1,005	208.0	6.1 (5.6–6.5)	3.2 (0.3)	—	—

KPY, per thousand patient-years. *Cox model specification: age at baseline, sex, smoking history, Charlson comorbidity index, and year of diagnosis.

Diabetes Care 35:299–304, 2012

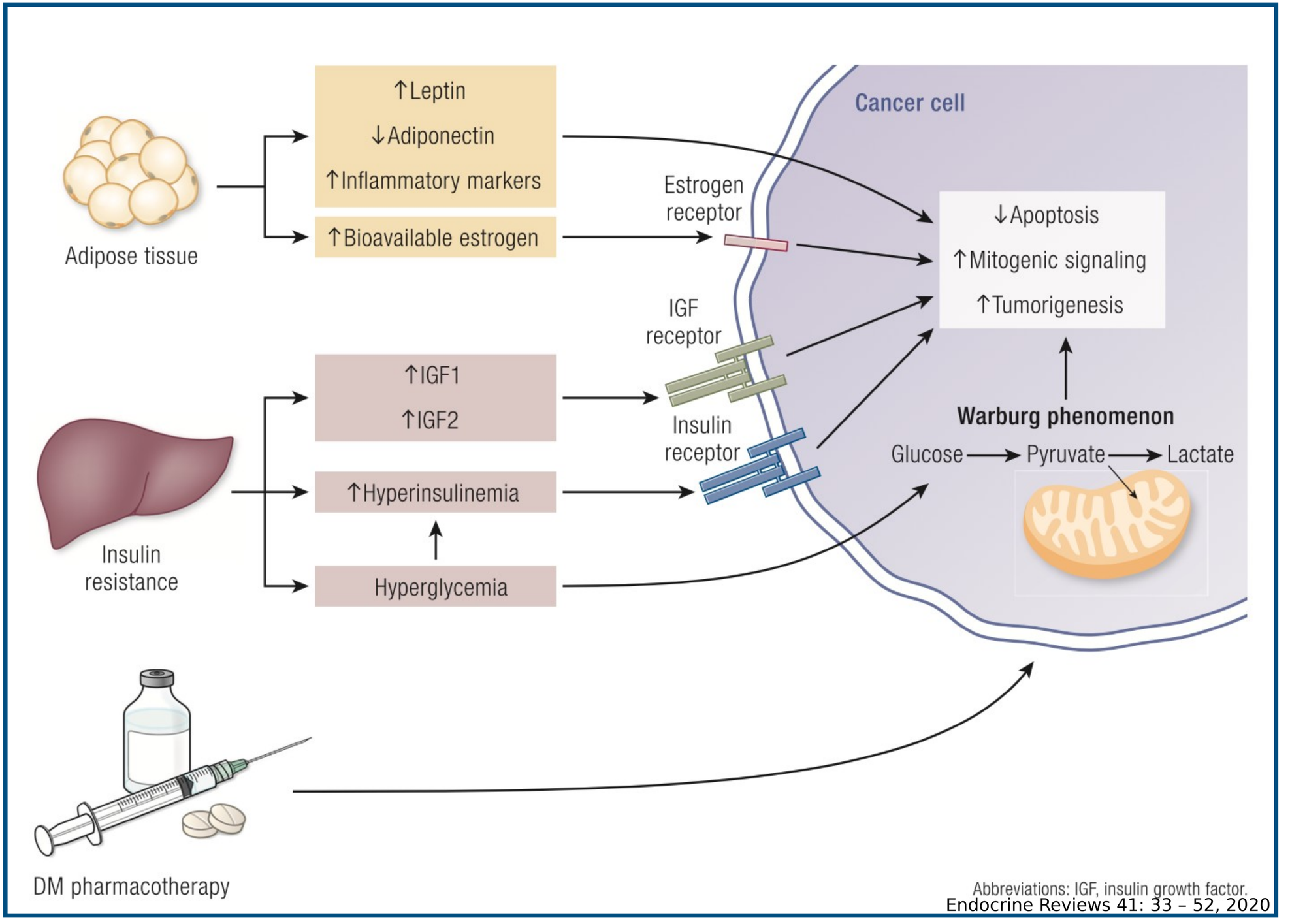
Peores *outcomes* en Cirugía Oncológica



British Journal of Anaesthesia, 133 (1): 67e76 (2024)

Cohorte Inglesa 2010-2020

Potenciales Mecanismos



Endocrine Reviews 41: 33 – 52, 2020

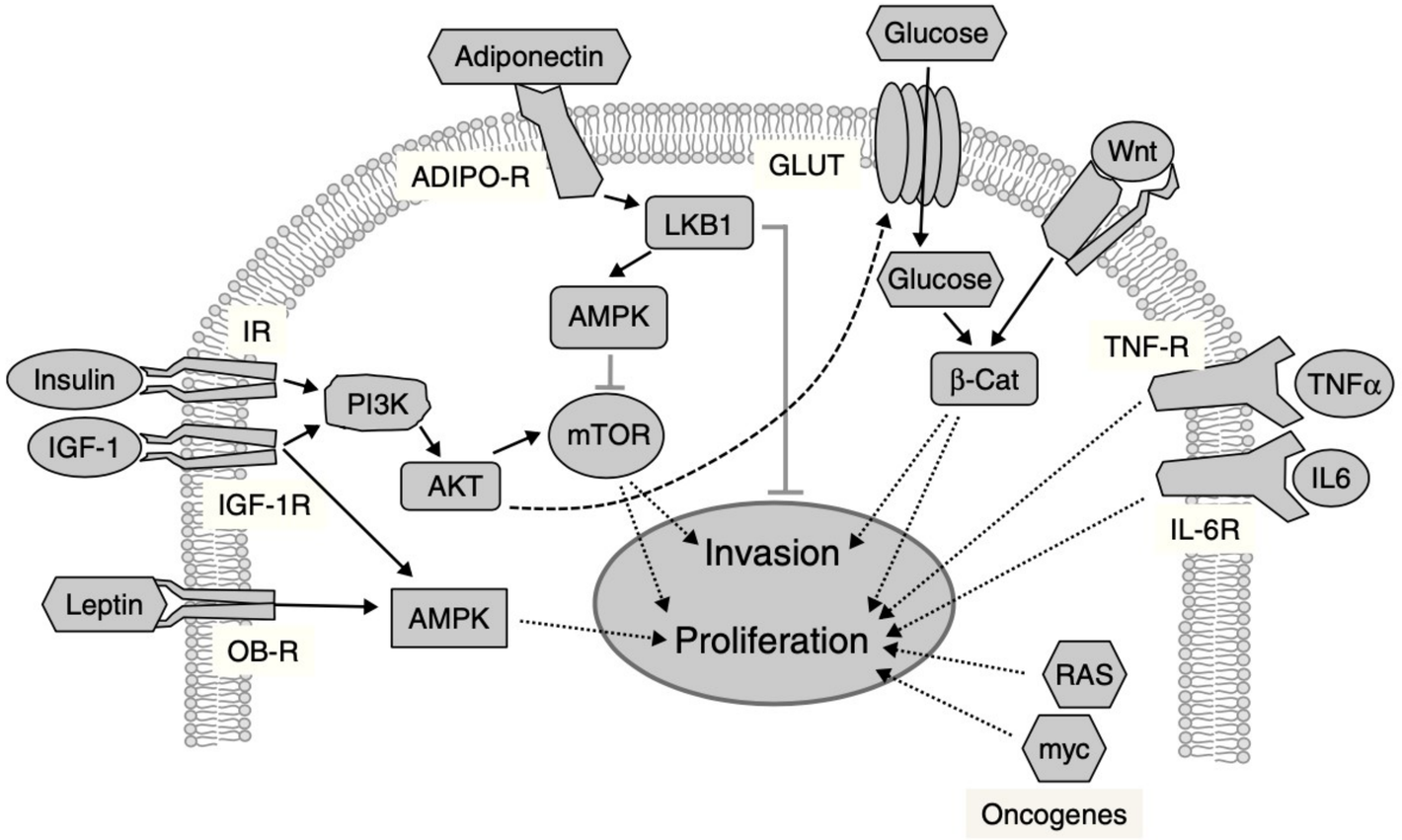


Figure 2 Signaling pathways implicated in the relationship between obesity, diabetes, and cancer. Insulin and IGF-1 bind to their receptors (IR and IGF-1R respectively), activating the PI3K/AKT/mTOR pathway, whose targets promote tumor proliferation and invasion. Adiponectin binds to its receptors (ADIPO-R1 and ADIPO-R2), inducing the LKB1/AMPK pathway, which inhibits mTOR by inhibiting tumor proliferation and metastasis. The insulin/PI3K/AKT pathway increases glucose uptake through glucose transporters (GLUT). High glucose levels potentiate Wnt/β-Catenin signaling, inducing tumor proliferation and invasion. Circulating leptin binds to its receptor (OB-R), activating the MAPK pathway, which increases proliferation. Through their receptors IL-6R and TNF-R, interleukin-6 (IL-6) and the tumor necrosis factor-α (TNFα) activate the JAK/STAT/NF-kB pathway, which inhibits apoptosis and promotes proliferation and metastasis. Oncogenic proteins such as *RAS* and *myc* alter the expression of metabolic enzymes, increasing glycolysis, which supports increased tumor cell proliferation.

Tratamientos del Cáncer y Riesgo DM2

Type of SACT	Drug examples	Risk of diabetes/hyperglycaemia (range of any grade)	Type of diabetes most likely to develop
Targeted therapy			
mTOR inhibitors	Everolimus[49,50]	12%–50%	T2DM
	Temsirolimus[50]	26%	
PI3K inhibitors	Alpelisib[51]	37%	T2DM
	Idelalisib[52]	28%/30%	
EGFR inhibitor	Osimertinib[53]	2%	T2DM
	Panitumumab[54,55]	1%–10%	
Multikinase inhibitor	Sunitinib[56–58]	0%–8%	Reverses T1/T2DM but also causes hyperglycaemia
	Pazopanib[58]	Risk of hypoglycaemia	
Tyrosine kinase inhibitor (TKI)	Nilotinib[59]	6%	T2DM
	Ponatinib[60]	3%	
ALK inhibitor	Ceritinib[61]	49%	T2DM
FLT3 inhibitor	Midostaurin[62,63]	7%–20%	T2DM
	Gilteritinib[64]	13%	
Monoclonal antibody	Gemtuzumab (anti-CD33) **inpatient use*[65]	10%	T2DM
Somatostatin analogues	Octreotide, lanreotide[66]	Up to 30%	T2DM, but risk of hypoglycaemia
Chemotherapy			
Anti-metabolite	5-fluorouracil[67,68]	Up to 10%	T2DM
	Pemetrexed[69,70]	4%	
	Decitadine/azacitidine[71]	6%–33%	
Alkylating agents	Busulfan[72]	66%–67%	
Platinum based	Oxaliplatin[73,74]	4%	
Anthracyclines	Doxorubicin[68,75]	Up to 10%	
Other	Arsenic trioxide[76]	45%	
ICPs			
PD-1	Nivolumab[27]	<1%	T1DM
	Pembrolizumab[28]	1%–2.2%	
CTLA-4	Ipilimumab[27]	0.02%	
	Combination ICP[77]	4%	

Corticoides y Riesgo Hiperglicemia

TABLE 2 Use of glucocorticoids in oncology/haemato-oncology

Metastatic spinal cord compression
Multiple myeloma/lymphoma
Immunotherapy toxicity
Superior vena cava obstruction
Graft versus host disease
Symptomatic brain metastases
Supportive treatment during chemotherapy (chemotherapy induced nausea and vomiting, prevention of allergic reactions etc.)

TABLE 3 Glucocorticoid dose equivalent[30]

Glucocorticoid (steroid)	Potency (equivalent doses)	Duration of action (half-life, in hours)
Hydrocortisone	20 mg	8
Prednisolone	5 mg	16–36
Methylprednisolone	4 mg	18–40
Dexamethasone	0.8 mg	36–54
Betamethasone	0.8 mg	26–54

TABLE 4 Risk factors for glucocorticoid inducted diabetes.

Pre-existing type 1 or type 2 diabetes
Family history of diabetes
Obesity
Increasing age
Ethnic minorities
Impaired fasting glucose or impaired glucose tolerance
Polycystic ovarian syndrome
Previous gestational diabetes
Previous development of hyperglycaemia on glucocorticoid therapy
Concurrent cytotoxic therapy known to cause hyperglycaemia

Diabetic Medicine. 2022;39:e14636.

Manejo Diabetes

	CANCER PRE-TREATMENT	CANCER TREATMENT	POST CANCER TREATMENT/ SURVIVORSHIP CARE
 Patients with normal glycaemic control	Risk factors for both diabetes and cancer (obesity, physical inactivity, smoking habit)	Iatrogenic hyperglycaemia and secondary diabetes diagnosis related to corticosteroids and specific cancer treatments Pancreatic cancer resection Destruction of the pancreatic tissue containing the islets of Langerhans	Increased risk of cancer relapse and progression Diabetes-related complications
 Patients with undiagnosed diabetes	Diabetes-related comorbidities and long-term complications	Hyperglycaemic crisis and related life-threatening conditions Limited compliance with treatment protocol Increased incidence and severity of treatment toxicities Worst prognosis	Increased risk of diabetes-related comorbidities and long-term complications Reduced quality of life
 Patients with a history of diabetes	Increased risk of developing some types of cancer Delay in cancer diagnosis Diabetes-related comorbidities	Hyperglycaemia-associated metabolic alterations Dehydration (hyperglycaemia, vomiting, diarrhoea) Increased risk of infections and sepsis Hyperglycaemia management Less aggressive cancer treatment Discontinuation of cancer treatments Surgical complications Catabolic weight loss Increased incidence of some treatment toxicities Worst prognosis Low cumulative survival rate in patients undergoing insulin treatments Aggressiveness of neoplastic cell growth related to chronic hyperinsulinemia and hyperglycaemia Delayed wound healing	Increased risk of cancer relapse and progression Increased risk of diabetes-related comorbidities

ESMO Open, December 2023 , Volume 8, Issue 6

Tratamiento

Generalidades

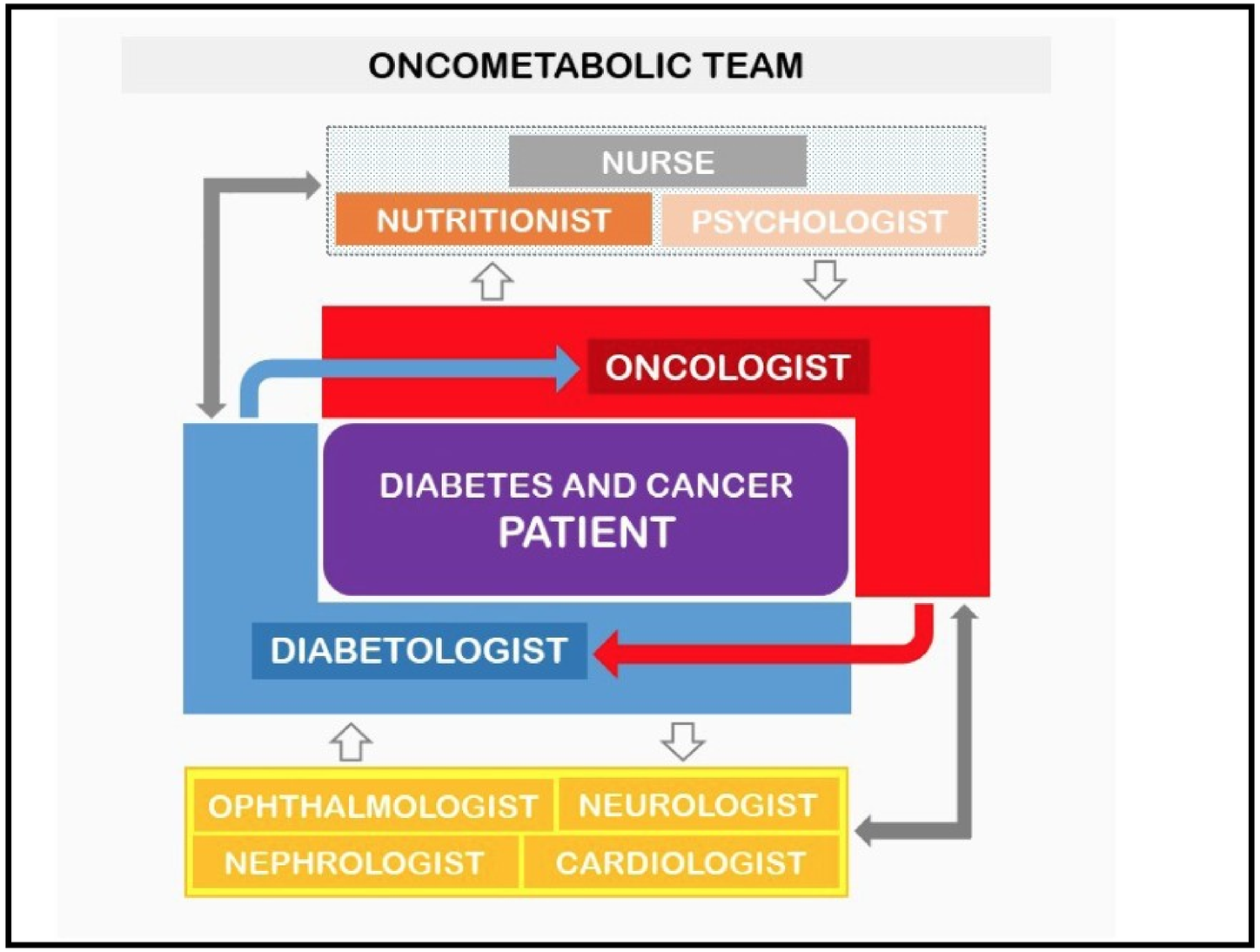
- En paciente con QMT siempre considerar efectos adversos gastrointestinales, nos limitarían usar: **GLP1a, Metformina, Acarbosa**.
- En contexto hipercatabólico deberíamos buscar alternativas a **aGLP1, iSGLT2, metformina**. **Insulina** seria de elección.
- **Metformina:** evaluar riesgo deshidratación y/o nefrotoxicidad por QMT o medios de contraste.
- **iSGLT2:** evaluar riesgo de deshidratación por QMT y posibilidad infecciones urinarias en contexto inmunosupresión.
- **Insulina**: requiere educación, automonitoreo (SMBG/MCG) y riesgo de hipoglucemias.
- Recomendar vacunas (neumococo, influenza, covid, herpes)

Patient Population	Implications	Potential Interventions
Persons with high BMI, obesity	• ↑ risk of cancer with rising BMI • ↑ risk of cancer with centripetal adiposity, GDM, prediabetes	• Weight loss programs • Bariatric surgery • Insulin sensitizing medications • Modified cancer screening guidelines
Persons with diabetes		
Type 1	• Possible ↑risk of certain cancers	• Optimize cancer screening adherence • Further research needed
Type 2	• ↑ risk of certain cancers • Strongest risk at diabetes diagnosis • ↑ BMI adds to cancer risk • Antihyperglycemic agents may modulate cancer risk	• Clinical screening for cancer at diabetes diagnosis • Optimize cancer screening adherence • Weight loss • Further research on drug effects needed
Cancer survivors		
Pediatric/adolescent	• ↑risk of future diabetes • Strongest diabetes risk with total body or abdominal irradiation • Insulinopenia more common	• Earlier, more frequent diabetes screening • Diabetes prevention programs
Adult	• ↑risk of future diabetes for most cancers • Certain cancer therapies may promote diabetes risk	• Earlier, more frequent diabetes screening • Diabetes prevention programs • Further research on cancer therapy effects needed
Cancer survivors with diabetes	• ↑ all-cause mortality • ↑risk of avoidable diabetic complications after cancer diagnosis	• Better diabetes management resources durin cancer treatment • Optimize long-term diabetes care • Further research needed

Endocrine Reviews, February 2020, 41(1):33–52

Futuro

Equipo OncoDIABETES



Explor Med. 2020;1:184-204

Conclusión

- La coexistencia de Diabetes y Cáncer nos plantea un **gran desafío**, tanto en su prevención como en su manejo.
- La compleja relación entre estas dos entidades nos obliga a realizar un **manejo multidisciplinario y colaborativo**.
- Ideal desarrollar **protocolos de manejo y derivación** para facilitar el flujo y optimizar tiempos de atención.
- Conducta **activa / screening**.
- Siempre: **PREVENCIÓN**.

MUCHAS GRACIAS ...