

obezite



ve B brek Hastalığı

Dr. Kamil DİLEK

U. .T.F. Nefroloji Bilim Dalı

Sunum Planı

Obezite ve Böbrek Hastalığı: Epidemiyolojik Kanıtlar

Vücut kitle indeksi

Metabolik sendrom

Bel/kalça oranı ve renal hasar

Obezite ve Böbrek Hastalığı: Patogenez

Hemodinamik anomaliler

Adipokinler

İnflamatuvar sitokinler

Lipotoksisite

Endotel disfonksiyonu

Türkiye'de Obezite

- ▶ **TOHTA***;
 - BKİ >30 kg/m² kadınlar:%36
 - Erkekler: %21.5
 - Genel obezite insidansı: %25
- ▶ **TEKHARF****: obezite prevalansı;
 - Erişkin kadınlarda %43
 - Erkeklerde %21.1**
- ▶ **TEKHARF*****: Bel çevresi > 102 cm olan erkekler %17, bel çevresi >88 cm kadınlar %56
- ▶ **TURDEP**: BKİ>30 kg/m²:%22, BKİ :25-30 kg/m² %35

*Hatemi H ve ark. Endokrinolojide Yönelişler 2002; 11(1 eki):1-15

**Onat A. ve ark. TEKHARF, Argos İletişim 2001.

***Satman I, and the TURDEP Group. TURDEP Study Diabetes Care 2002

Obezite İlişkili Glomerulopati

- ▶ İlk kez 1974'de tanımlanmıştır
- ▶ FSGS ile uyumlu histopatolojik bulgu
- ▶ Glomerulomegali
- ▶ 10 yıllık renal survi %51
- ▶ İdiopatik FSGS'ye göre yavaş progresyon
- ▶ Podosit hasarı daha az

Obezite İlişkili Glomerulopati

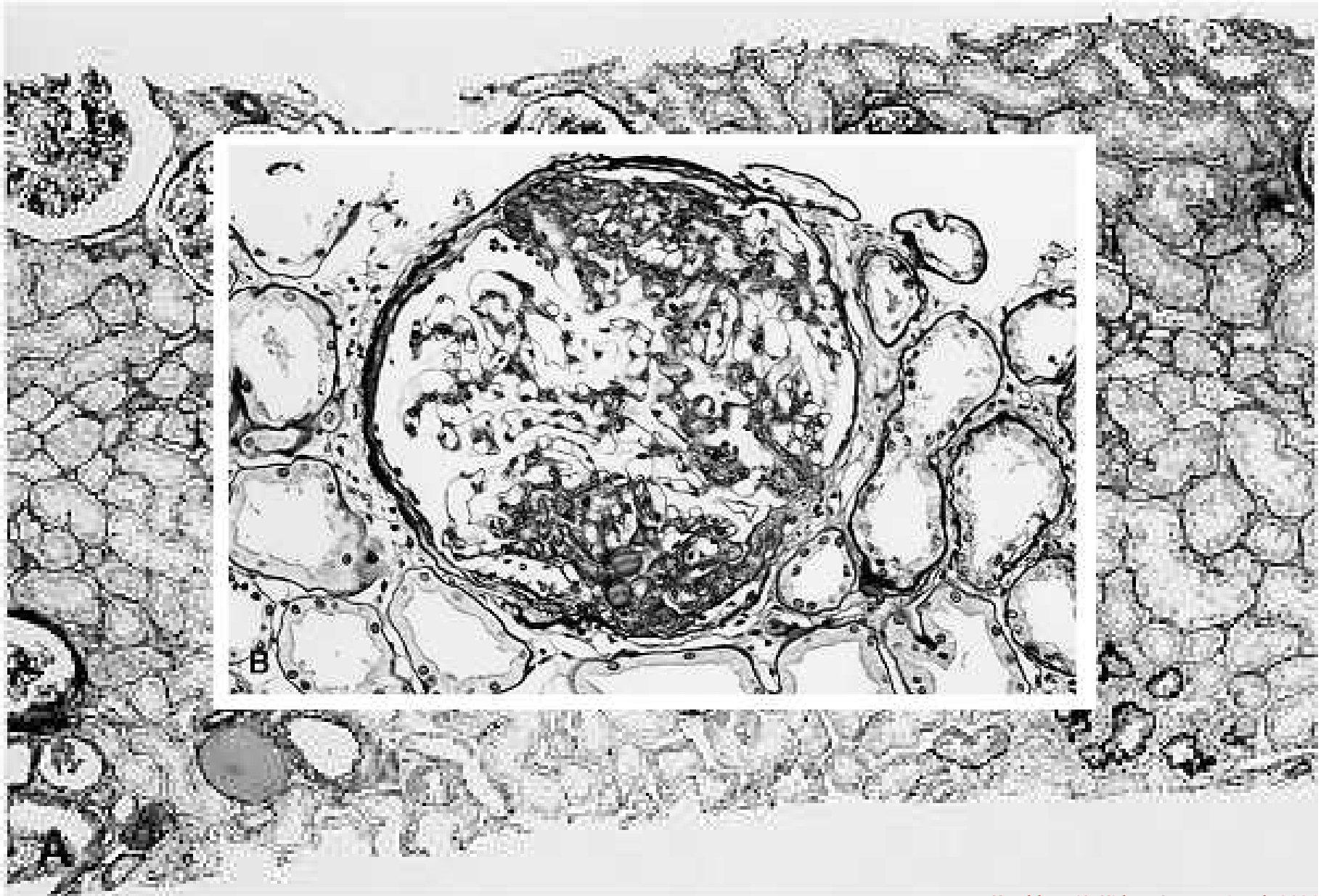
- ▶ ABD'de 6818 renal biyopsi değerlendirildiğinde;
 - ▶ 1986 ⇒ 2000
 - ▶ %0.2 ⇒ %2
 - ▶ İnsidans 10 kat artış göstermiştir
 - ▶ %48 nefrotik proteinüri
 - ▶ %52 subnefrotik proteinüri
 - ▶ %44 renal yetmezlik

Obezite İlişkili Glomerulopati

Obezite:

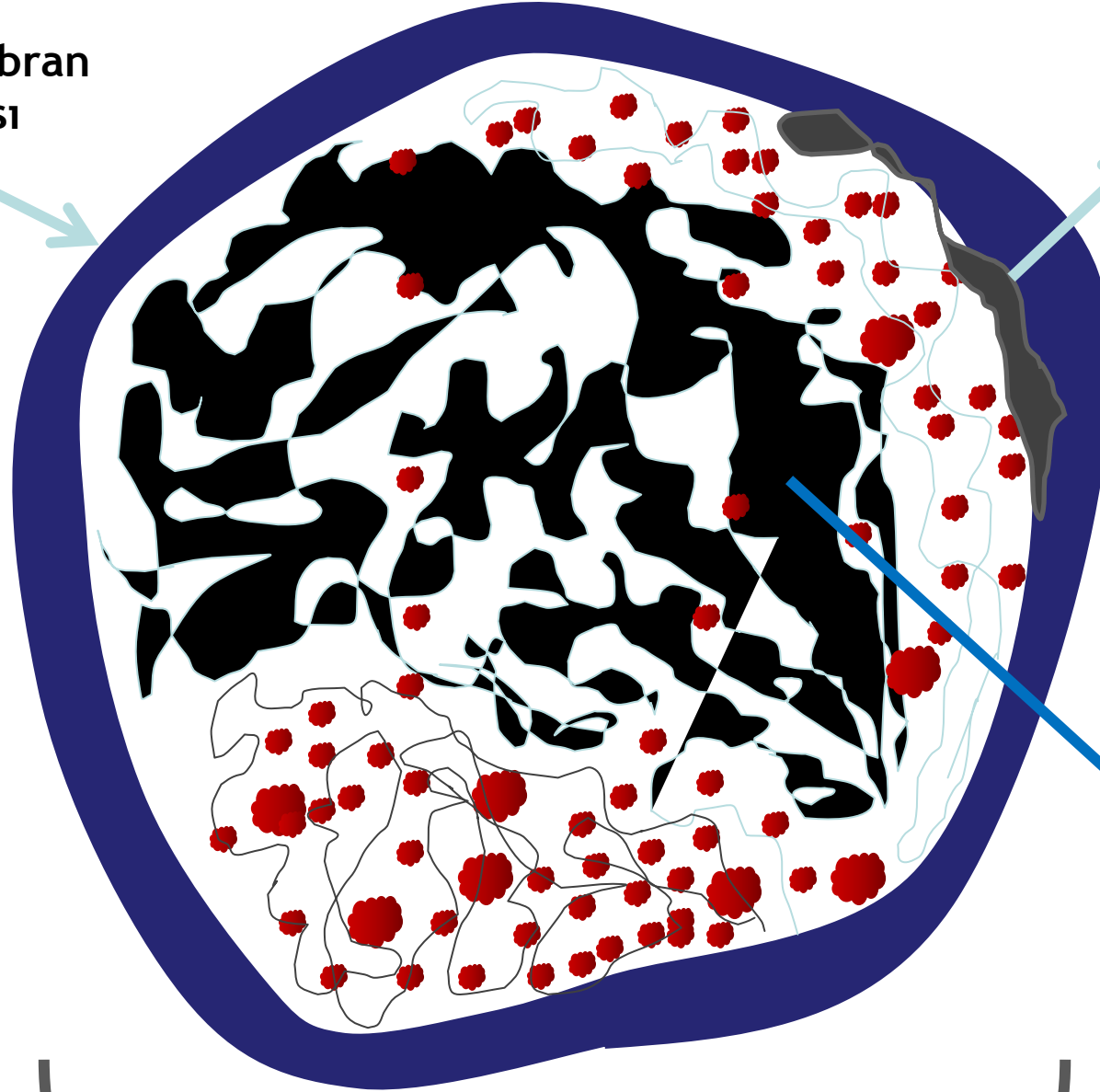
- ▶ IgA nefropatisi
- ▶ Allograft nefropatisi
- ▶ FSGS
- ▶ Ünilateral renal agenezis veya nefrektomi

Gelişimi ve progresyonu için bağımsız risk faktörüdür



Bazal membran kalınlaşması

Kapsül adezyonu



skleroz

256 ± 24 μm

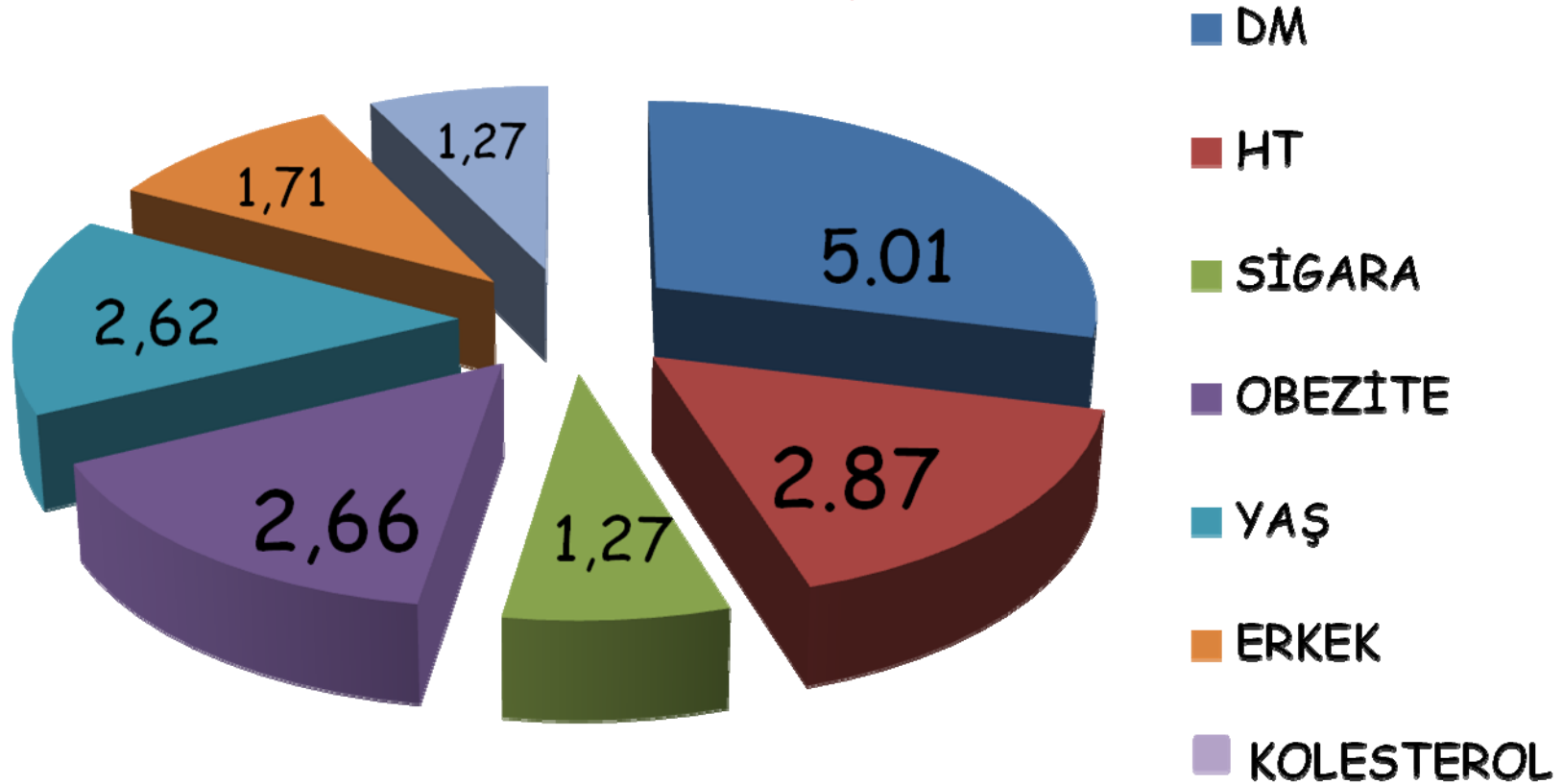
Çocukluk Çağında Obezite ve Renal Hasar

773 olgu
Yaş: 6-14

	BMI: 10-15	BMI: 15-20	BMI: 20-25	BMI: 25-30	BMI>30
Asemptomatik proteinüri prevalansı	%8.5	%13.5	%11.8	%8.6	%21.2

Son Dönem Böbrek Yetersizliği Risk Faktörleri

RR Artışı



Original Article

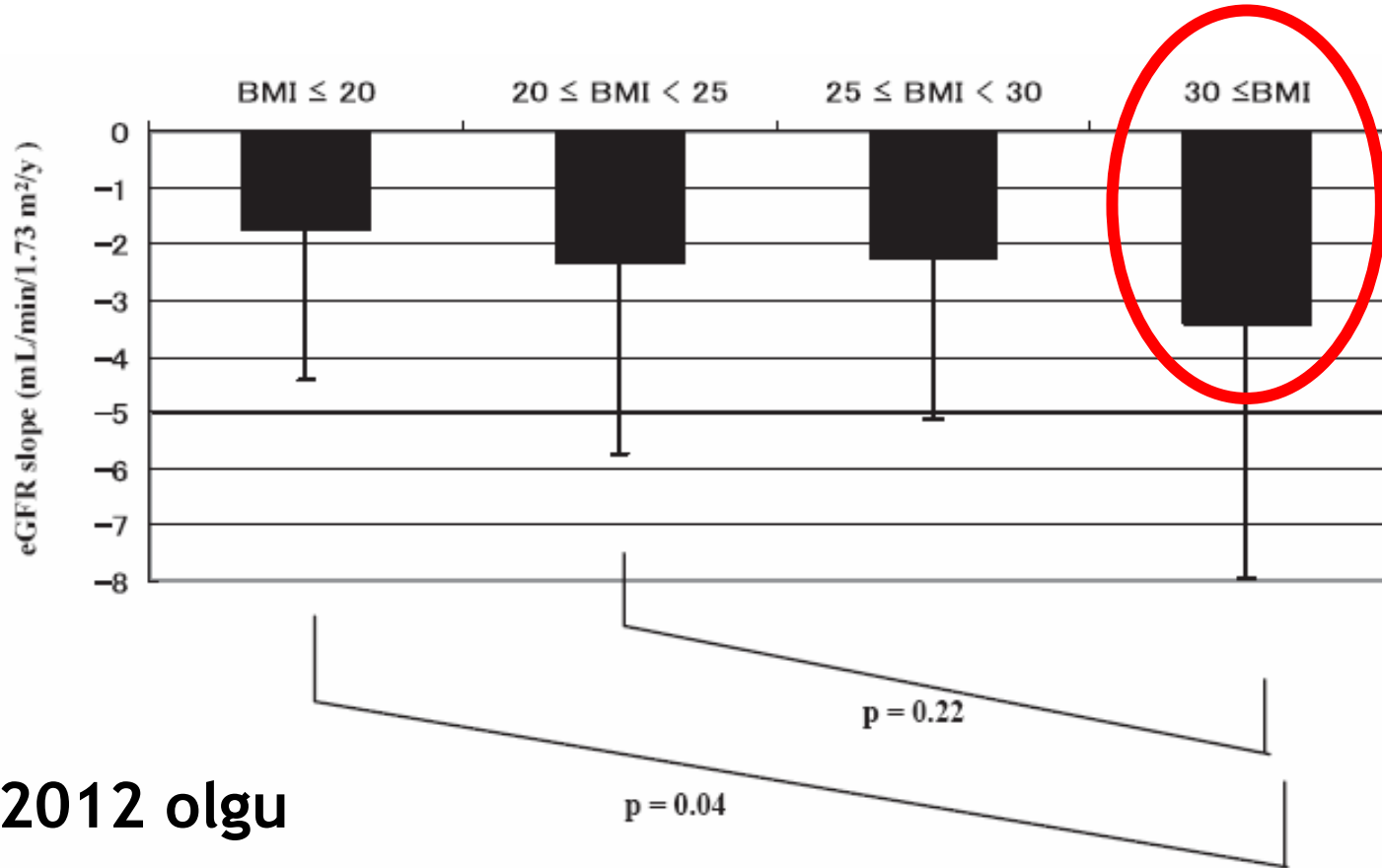
Journal of INTERNAL MEDICINE

doi: 10.1111/j.1365-2796.2009.02197.x

Risk factors for end-stage renal disease in a community-based population: 26-year follow-up of 25 821 men and women in eastern Finland

M. Kastarinen¹, A. Juutilainen^{1,2}, H. Kastarinen¹, V. Salomaa³, P. Karhapää¹, J. Tuomilehto^{3,4,5}, C. Grönhagen-Riska^{6,7}, P. Jousilahti³ & P. Finne^{6,7,8}

Vücut Kitle İndeksi ve GFR Azalması



2012 olgu
5 yıl takip

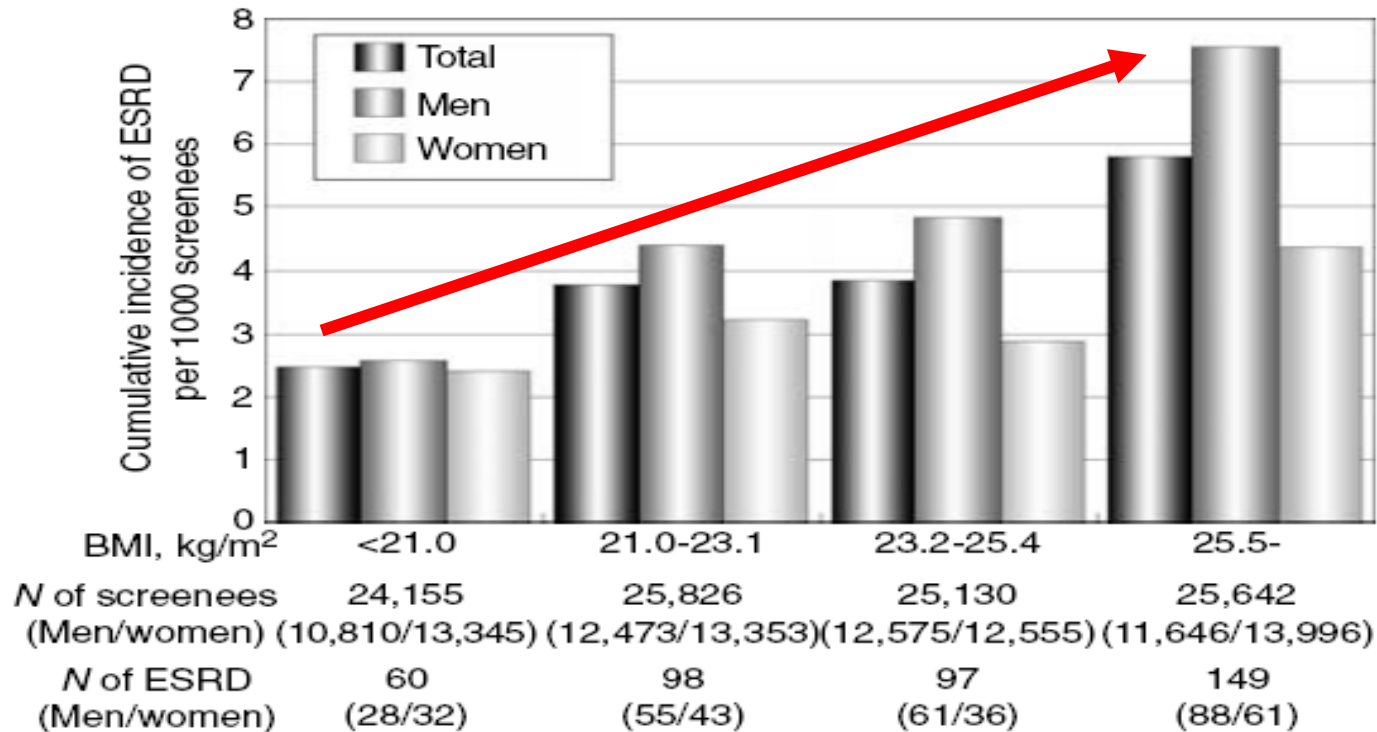
Obezite ve KBY Gelişim Riski

Framingham Heart Study

2676 olgu 18.5 yıldan daha uzun süre izlendiğinde

	KBY (Evre 3) riski	CVH riski (Hipertansiyon, sigara, HDL kolesterol, diyabet) eşleştirildiğinde
Aşırı kilo	1.29	1.06
Obez	1.68	1.09

Vücut Kitle İndeksi ve Son Dönem Böbrek Yetmezliği Gelişimi



Body mass index and the risk of development of end-stage renal disease in a screened cohort. Kidney International, Vol. 65 (2004), pp. 1870-1876

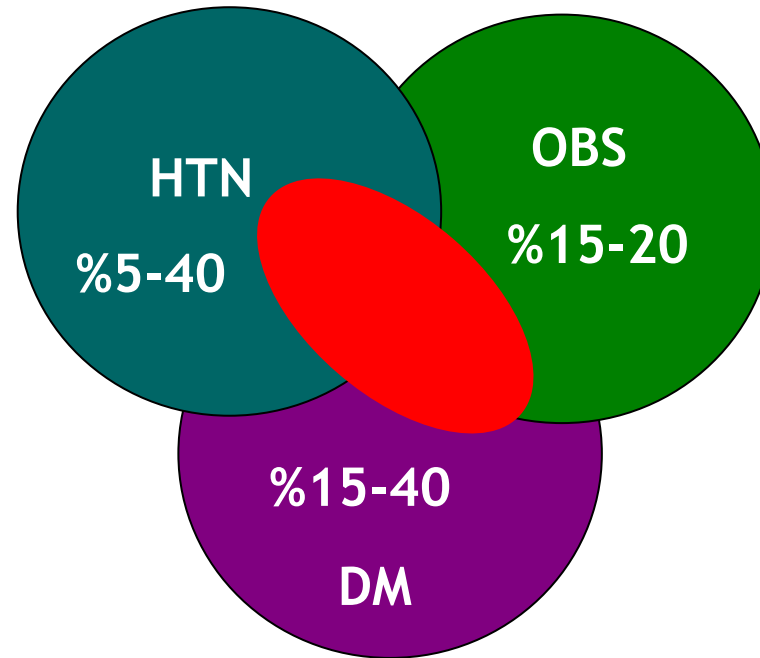
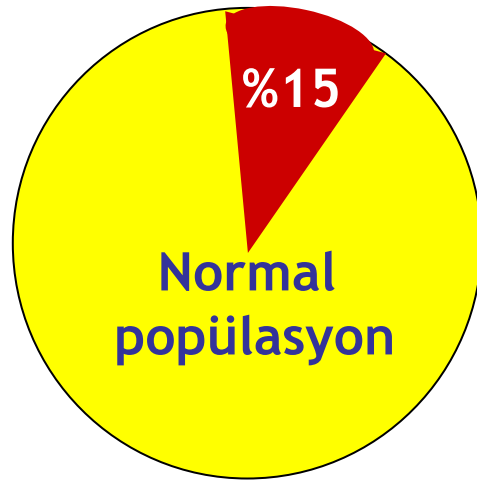
Obezite ve Son Dönem Böbrek Yetmezliği Gelişim Riski

320252 olgu
15-35 yıl takip edildiğinde

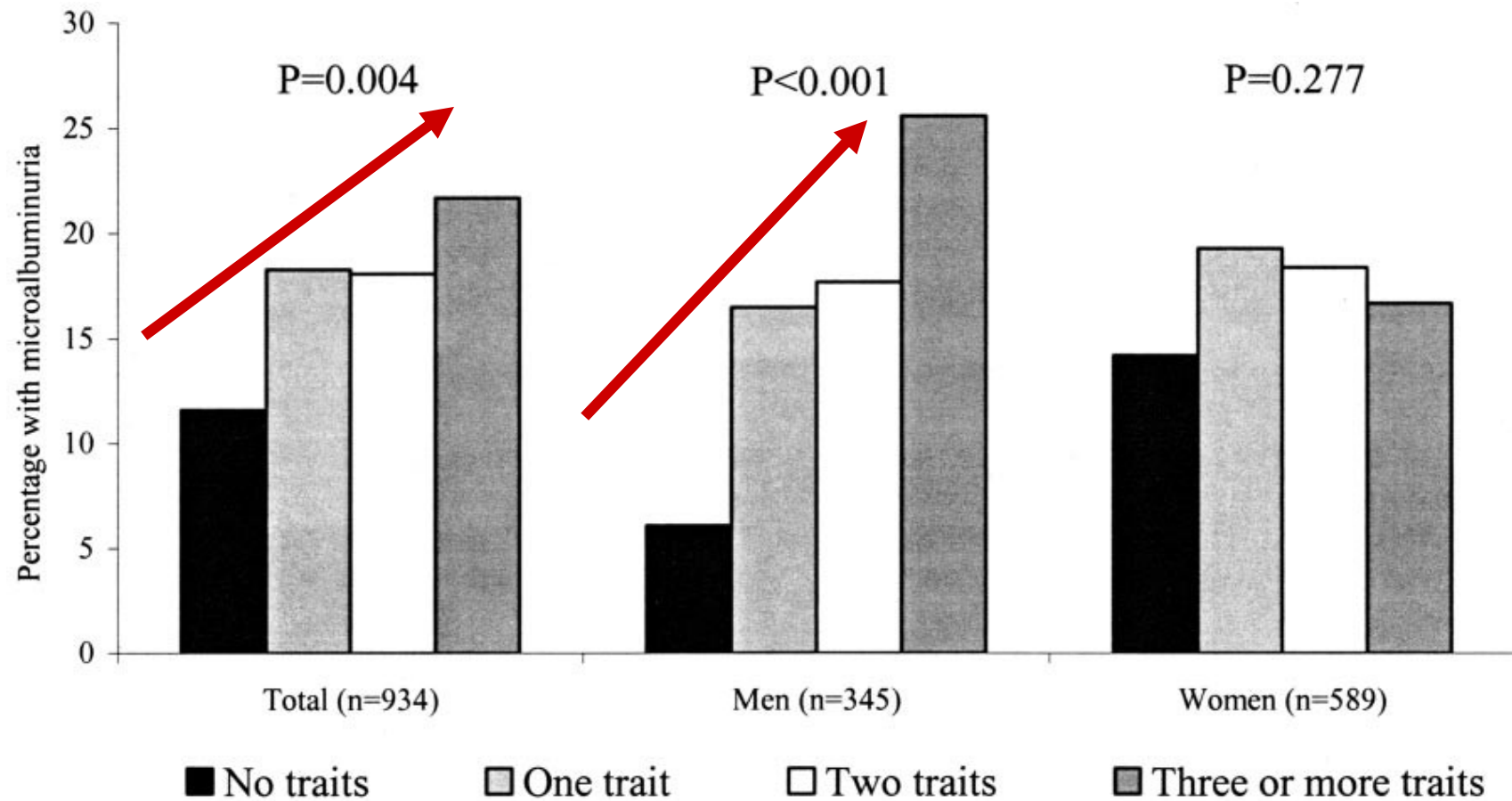
	SDBY gelişim Riski
Normal kilolu	1
Obez	1.87
Klas I Obezite BMI: 30-34.9	3.57
Klas II Obezite BMI: 35-39.9	6.2
Klas III Obezite BMI: >40	7



Mikroalbuminüri: Metabolik Sendrom ile İlişkisi

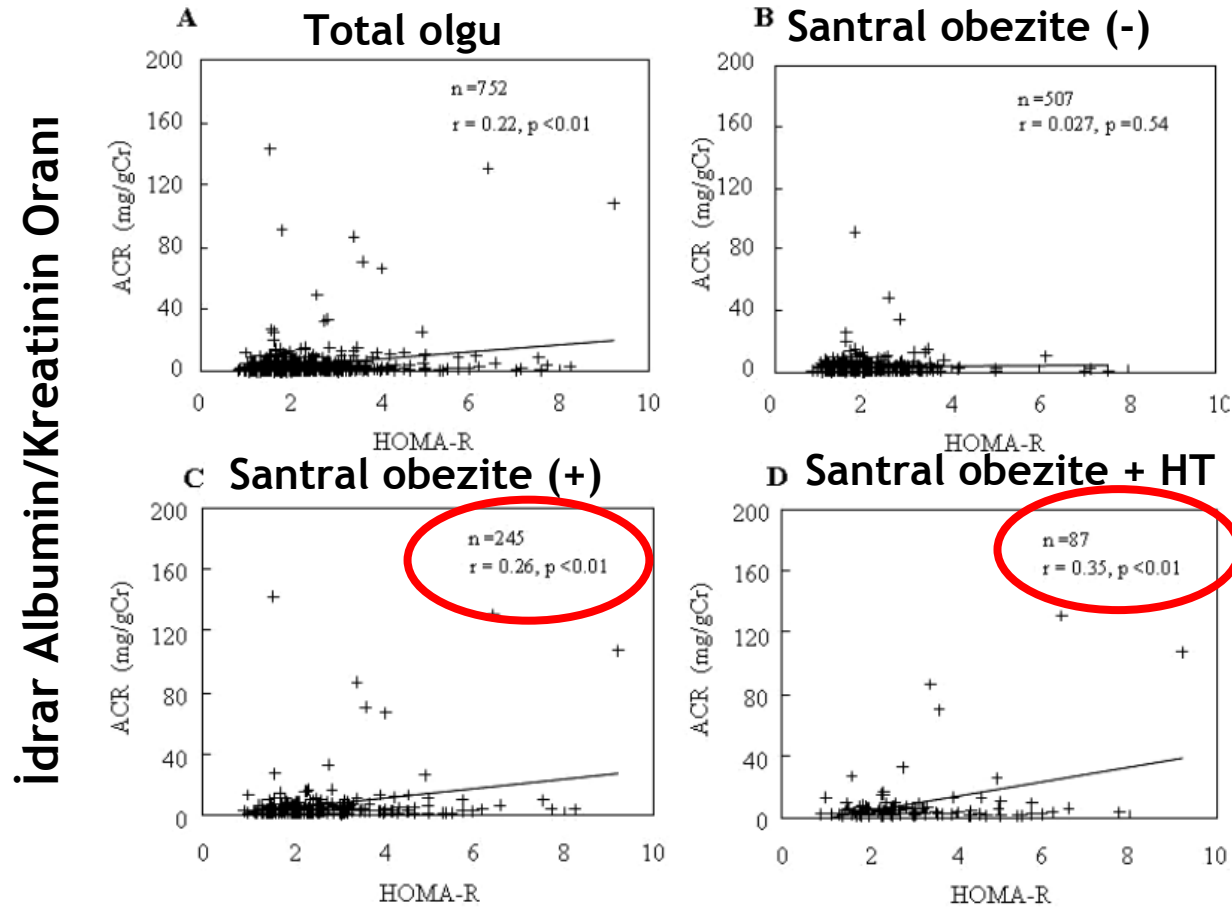


Metabolik Sendrom Mikroalbuminüri İlişkisi



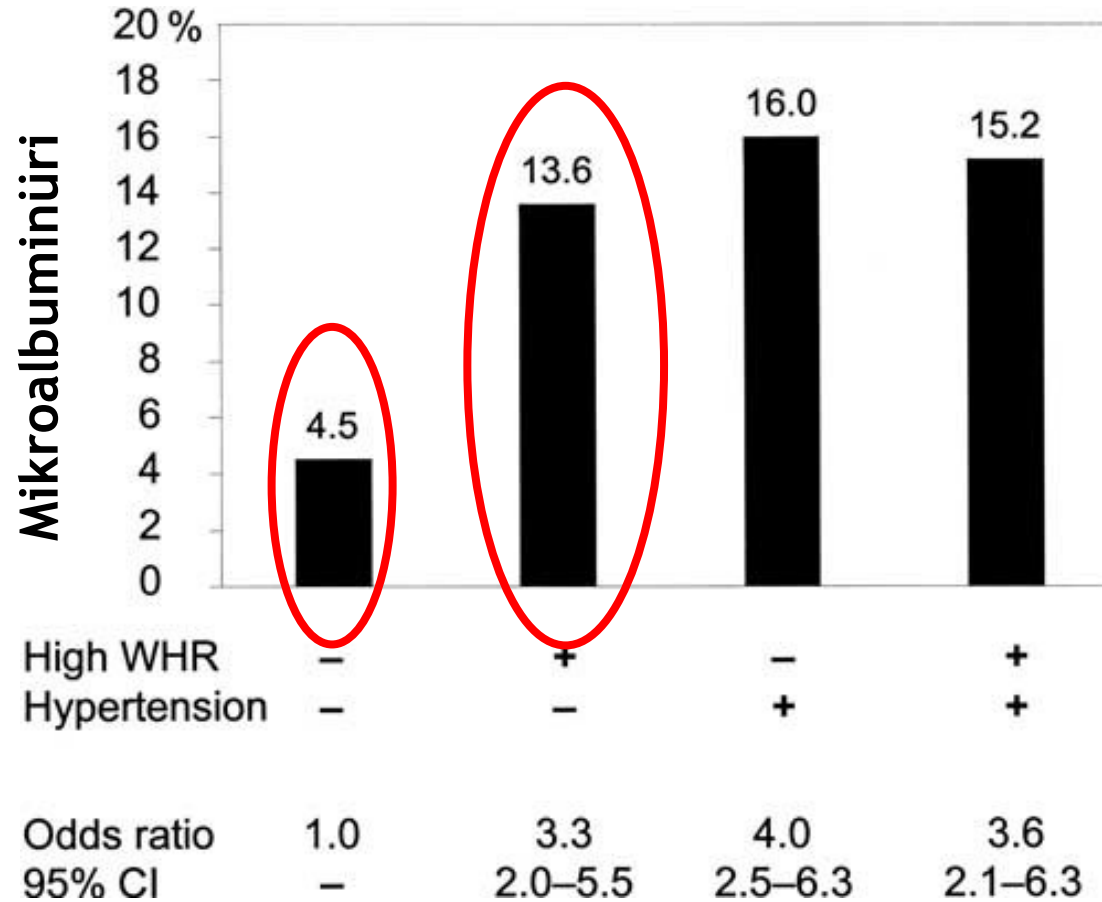
Association of the insulin resistance syndrome and microalbuminuria among nondiabetic native Americans. The Inter-Tribal Heart Project. J Am Soc Nephrol. 2002 Jun;13(6):1626-34.

Santral Obezite-İnsülin Direnci Mikroalbuminüri İlişkisi



Association of Urinary Albumin Excretion with Insulin Resistance in Japanese Subjects: Impact of Gender Difference on Insulin Resistance. Inter Med 48: 1621-1627, 2009

Bel-Kalça Çevresi Oranı ve Mikroalbuminüri



Microalbuminuria, central adiposity and hypertension in the non-diabetic urban population of the MONICA Augsburg survey 1994/95. *Journal of Human Hypertension* (2001) 15, 799-804

Bel-Kalça Çevresi Oranı ve Mikroalbuminüri

Table 1 Mean, age-adjusted levels of measures of anthropometry and body composition in non-diabetic persons with and without microalbuminuria. MONICA Augsburg survey 1994/95, city of Augsburg

	Men			Women		
	Microalbuminuric (n = 79)	Normoalbuminuric (n = 841)	P-value	Microalbuminuric (n = 71)	Normoalbuminuric (n = 808)	P-value
Weight (kg)	83.0	82.0	0.4898	70.4	68.0	0.1142
Body mass index (kg/m ²)	27.3	26.9	0.3399	27.6	26.1	0.0088
<i>Obese (BMI ≥30 kg/m²)</i>	23.5%	15.6%	0.0704	36.3%	19.1%	0.0005
Waist circumference (cm)	96.8	94.6	0.0416	85.1	81.9	0.0111
<i>Waist ≥80th percentile^a</i>	29.1%	19.3%	0.0324	40.3%	18.6%	0.0001
Waist-to-hip ratio (WHR)	0.94	0.92	0.0058	0.81	0.80	0.0488
<i>WHR ≥80th percentile^a</i>	32.1%	19.2%	0.0048	30.7%	19.5%	0.0172
Body Fat (kg) ^b	24.3	23.4	0.1990	27.3	24.9	0.0202
<i>Body fat ≥80th percentile^{a,b}</i>	24.3%	19.5%	0.2942	34.2%	18.9%	0.0028
Fat free mass (kg) ^b	58.9	58.6	0.7120	43.5	43.1	0.4954
Percent body fat (%) ^b	28.9	28.2	0.1040	37.0	35.7	0.0760
<i>Percent body fat ≥80th percentile^{a,b}</i>	26.3%	19.3%	0.0921	39.4%	18.4%	0.0001

^aGender-specific percentiles; ^bResults based on 898 men (78 with microalbuminuria) and 851 women (64 with microalbuminuria).

Microalbuminuria, central adiposity and hypertension in the non-diabetic urban population of the MONICA Augsburg survey 1994/95. Journal of Human Hypertension (2001) 15, 799-804

Metabolik Sendrom ve KBY Gelişim Riski

31307 metabolik sendromu olmayan olgu
3670 metabolik sendromlu olgu
5.8 yıl takip edildiğinde

	MS (+)	MS (-)
Böbrek fonksiyon kaybı (GFR <60 ml/dk)	%5	%2.4

Metabolic syndrome and risk of development of chronic kidney disease: the Niigata preventive medicine study. *Diabetes Metab Res Rev* 2010; 26: 26-32.

Metabolik Sendrom ve KBY Gelişim Riski

Table 4. Metabolic syndrome and risk of kidney dysfunction: multivariate models^a

	All subjects		Subjects without antihypertensive drug, diabetes, or CVD		Subjects ≤60 years without antihypertensive drug, diabetes, or CVD	
	HR (95% CI)	p value	HR (95% CI)	p value	HR (95% CI)	p value
Metabolic syndrome	2.12 (1.81–2.5)	<0.001	1.99 (1.56–2.54)	<0.001	2.11 (1.26–3.53)	0.005
Metabolic syndrome components						
Obesity	1.40 (1.21–1.62)	<0.001	1.21 (0.98–1.49)	0.08	1.56 (1.04–2.33)	0.03
Elevated blood pressure	1.95 (1.68–2.26)	<0.001	1.70 (1.41–2.04)	<0.001	1.53 (1.06–2.21)	0.02
Low HDL cholesterol	1.67 (1.42–1.97)	<0.001	1.42 (1.13–1.79)	0.003	1.78 (1.14–2.78)	0.01
Elevated triglycerides	1.72 (1.47–2.01)	<0.001	1.77 (1.43–2.2)	<0.001	1.86 (1.2–2.89)	0.005
Impaired glucose tolerance	1.55 (1.29–1.85)	<0.001	1.84 (1.42–2.38)	<0.001	1.94 (1.06–3.54)	0.03
Metabolic syndrome components, <i>N</i>						
0	1		1		1	
1	1.69 (1.38–2.06)	<0.001	1.48 (1.17–1.88)	0.001	1.60 (1.01–2.55)	0.046
2	2.34 (1.9–2.89)	<0.001	2.15 (1.66–2.77)	<0.001	2.27 (1.36–3.78)	0.002
≥3	3.49 (2.79–4.37)	<0.001	2.88 (2.14–3.87)	<0.001	3.09 (1.7–5.59)	<0.001
Trend across number of components	1.49 (1.39–1.59)	<0.001	1.43 (1.31–1.56)	<0.001	1.46 (1.22–1.74)	<0.001

Kidney dysfunction was defined by occurrence of estimated glomerular filtration rate <60 mL/min/1.73 m².

^aModels were adjusted for sex and age.

Metabolic syndrome and risk of development of chronic kidney disease: the Niigata preventive medicine study. *Diabetes Metab Res Rev* 2010; 26: 26-32.

Metabolik Sendrom ve Proteinüri Gelişim Riski

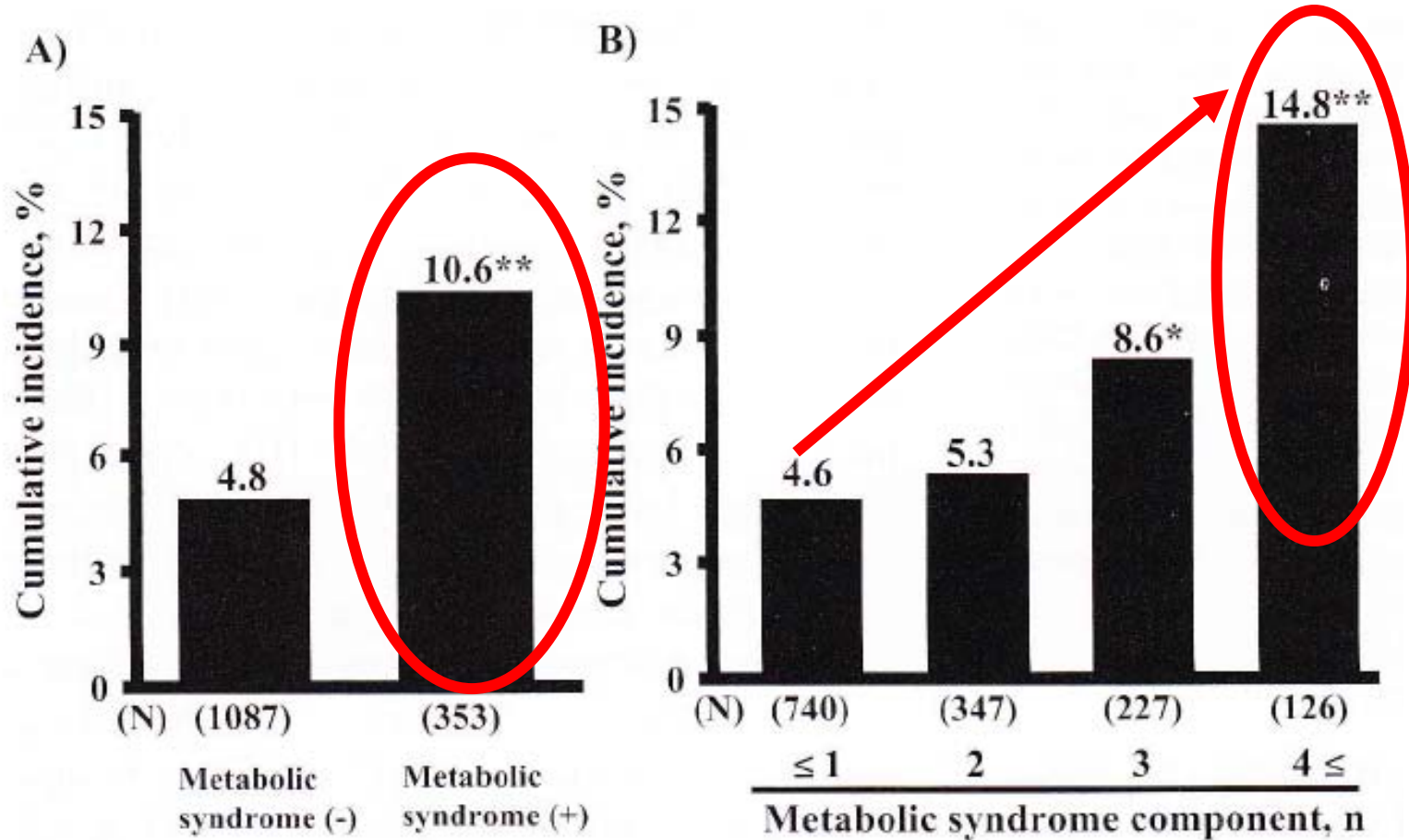
Table 5. Metabolic syndrome and risk of proteinuria: multivariate models^a

	All subjects		Subjects without antihypertensive drug, diabetes, or CVD		Subjects ≤60 years without antihypertensive drug, diabetes, or CVD	
	HR (95% CI)	p value	HR (95% CI)	p value	HR (95% CI)	p value
Metabolic syndrome	1.76 (1.57–1.98)	<0.001	1.64 (1.39–1.93)	<0.001	2.14 (1.69–2.7)	<0.001
Metabolic syndrome components						
Obesity	1.63 (1.48–1.79)	<0.001	1.6 (1.42–1.8)	<0.001	1.93 (1.62–2.31)	<0.001
Elevated blood pressure	1.59 (1.45–1.74)	<0.001	1.45 (1.3–1.61)	<0.001	1.61 (1.37–1.91)	<0.001
Low HDL cholesterol	1.19 (1.05–1.34)	0.006	1.22 (1.04–1.42)	0.01	1.3 (1.04–1.64)	0.02
Elevated triglycerides	1.28 (1.15–1.43)	<0.001	1.25 (1.08–1.44)	0.002	1.51 (1.23–1.85)	<0.001
Impaired glucose tolerance	1.73 (1.54–1.95)	<0.001	1.31 (1.16–1.48)	<0.001	1.49 (1.09–2.03)	0.01
Metabolic syndrome components, <i>N</i>						
0	1		1		1	
1	1.43 (1.27–1.61)	<0.001	1.29 (1.13–1.48)	<0.001	1.31 (1.07–1.61)	0.009
2	1.95 (1.72–2.21)	<0.001	1.73 (1.49–2.01)	<0.001	1.97 (1.57–2.48)	<0.001
≥3	2.46 (2.14–2.84)	<0.001	2.07 (1.72–2.49)	<0.001	2.75 (2.12–3.57)	<0.001
Trend across number of components	1.32 (1.27–1.37)	<0.001	1.27 (1.21–1.33)	<0.001	1.36 (1.27–1.47)	<0.001

^aModels were adjusted for sex and age.

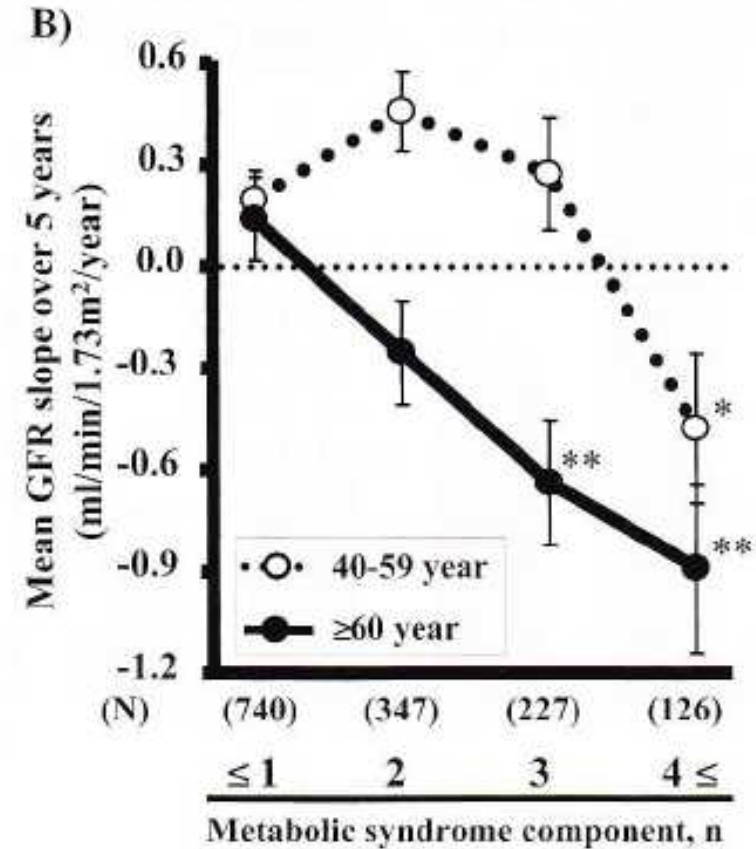
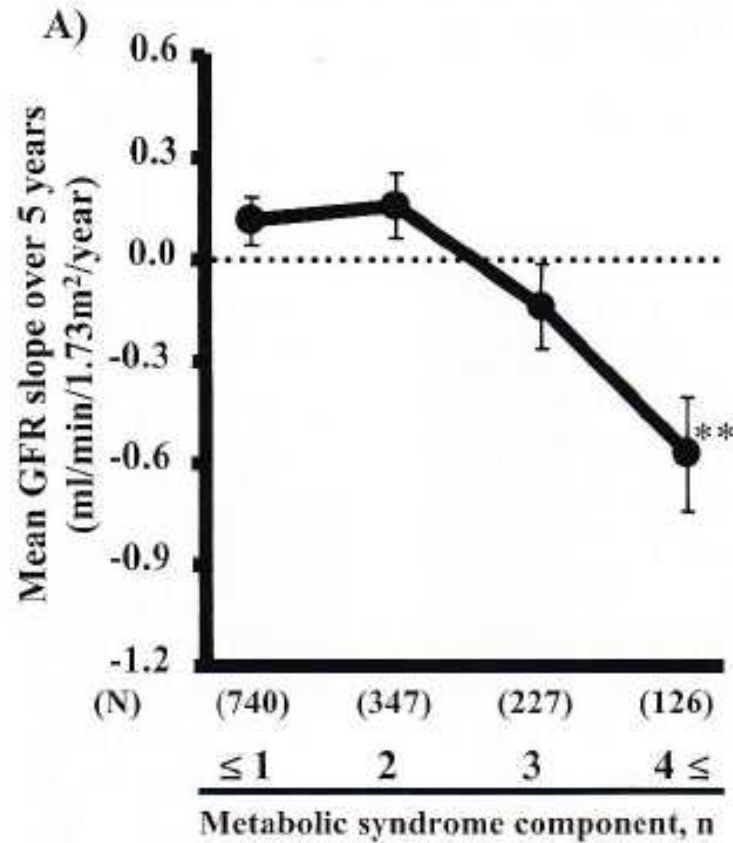
Metabolic syndrome and risk of development of chronic kidney disease: the Niigata preventive medicine study. *Diabetes Metab Res Rev* 2010; 26: 26-32.

Metabolik Sendrom ve KBY Gelişim Riski



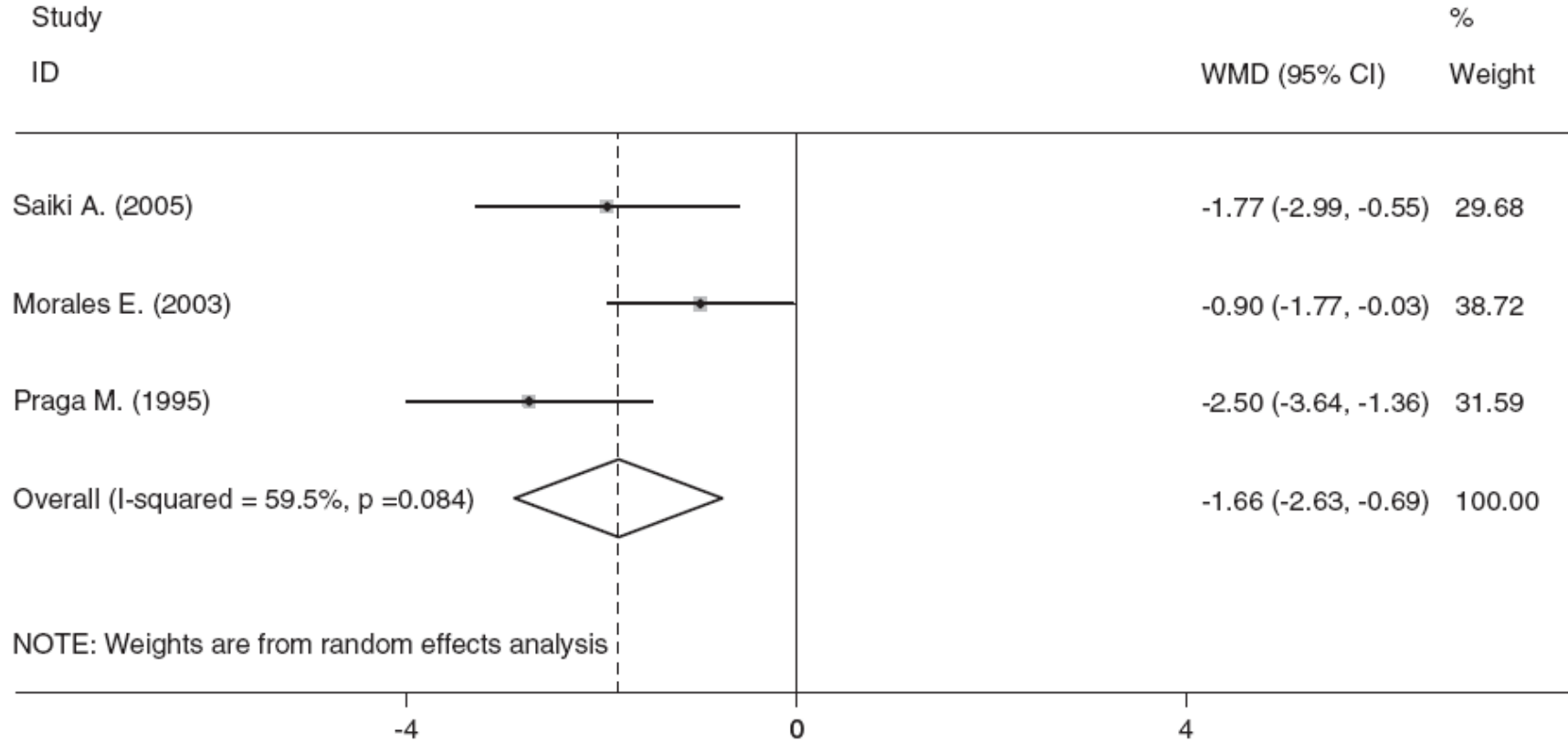
1440 olgu
5 yıl takip
GFR<60 ml/dk

Metabolik Sendrom ve KBY Gelişim Riski



1440 olgu
5 yıl takip
GFR<60 ml/dk

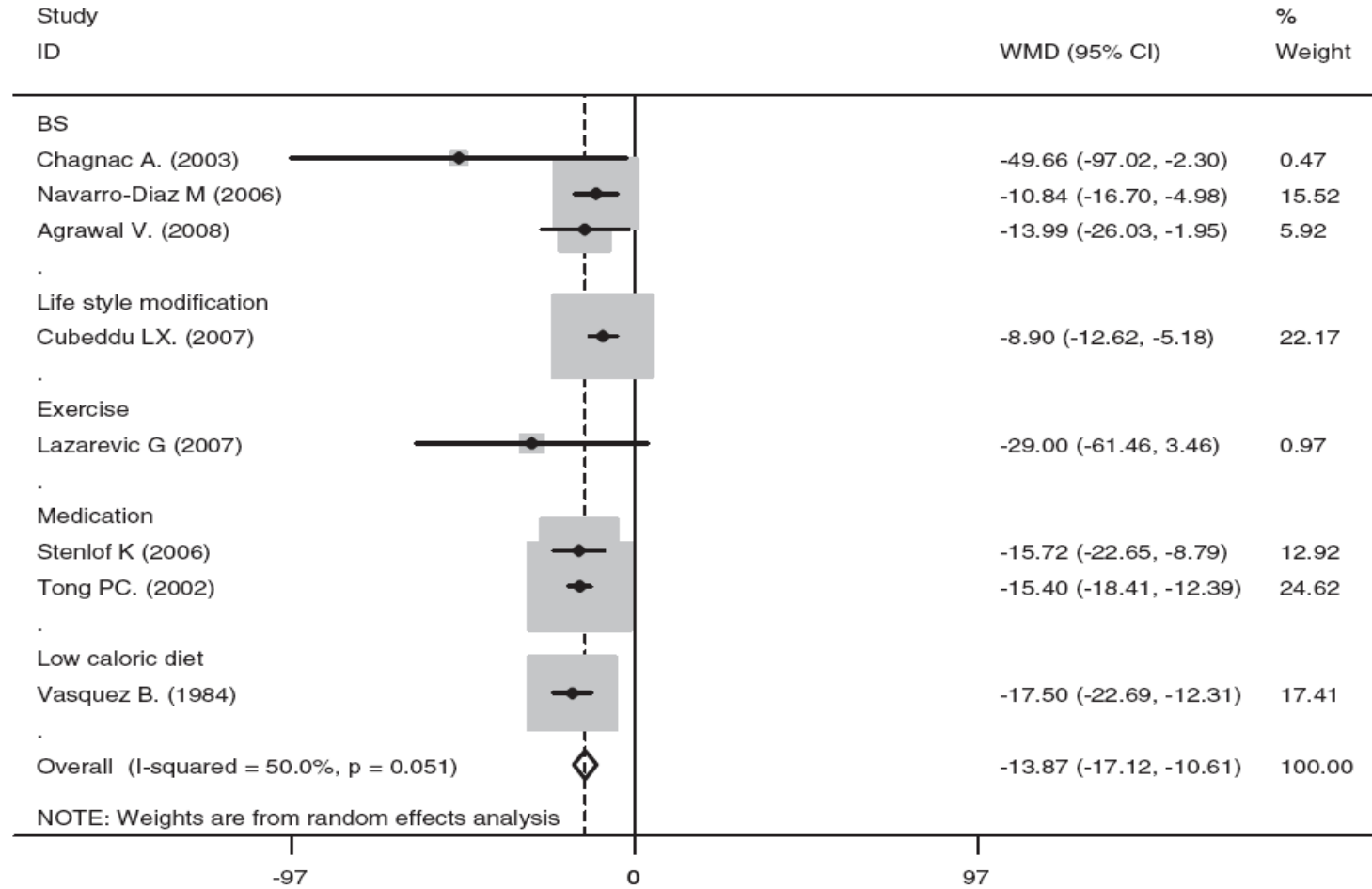
Kilo Kaybı ve Proteinüride Azalma



13 çalışmanın Meta-analizi
522 olgu

Weight loss and proteinuria: systematic review of clinical trials and comparative cohorts.
Nephrol Dial Transplant (2010) 25: 1173-1183

Kilo Kaybı ve Mikroalbuminüride Azalma



13 çalışmanın Meta-analizi

522 olgu

Weight loss and proteinuria: systematic review of clinical trials and comparative cohorts.
Nephrol Dial Transplant (2010) 25: 1173-1183





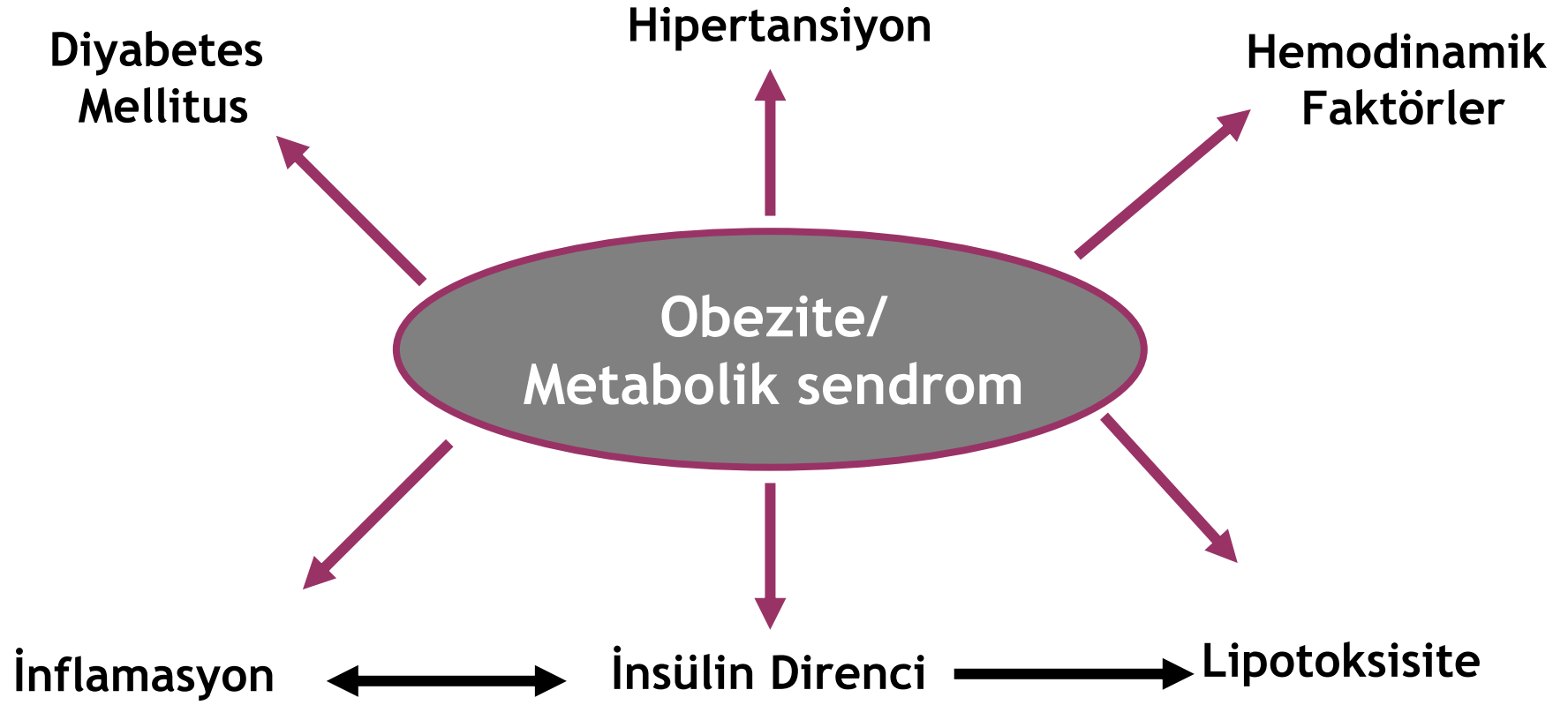


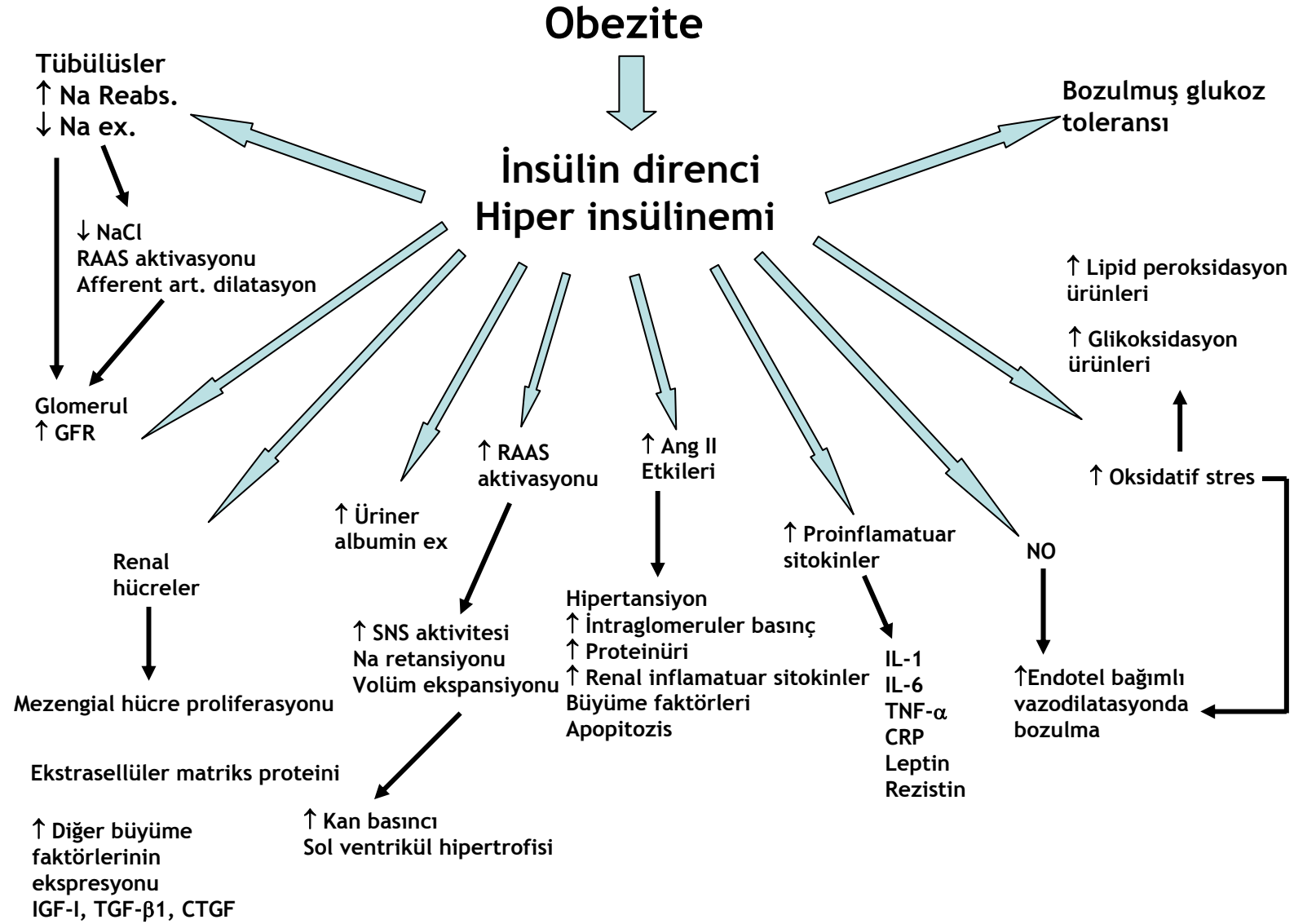




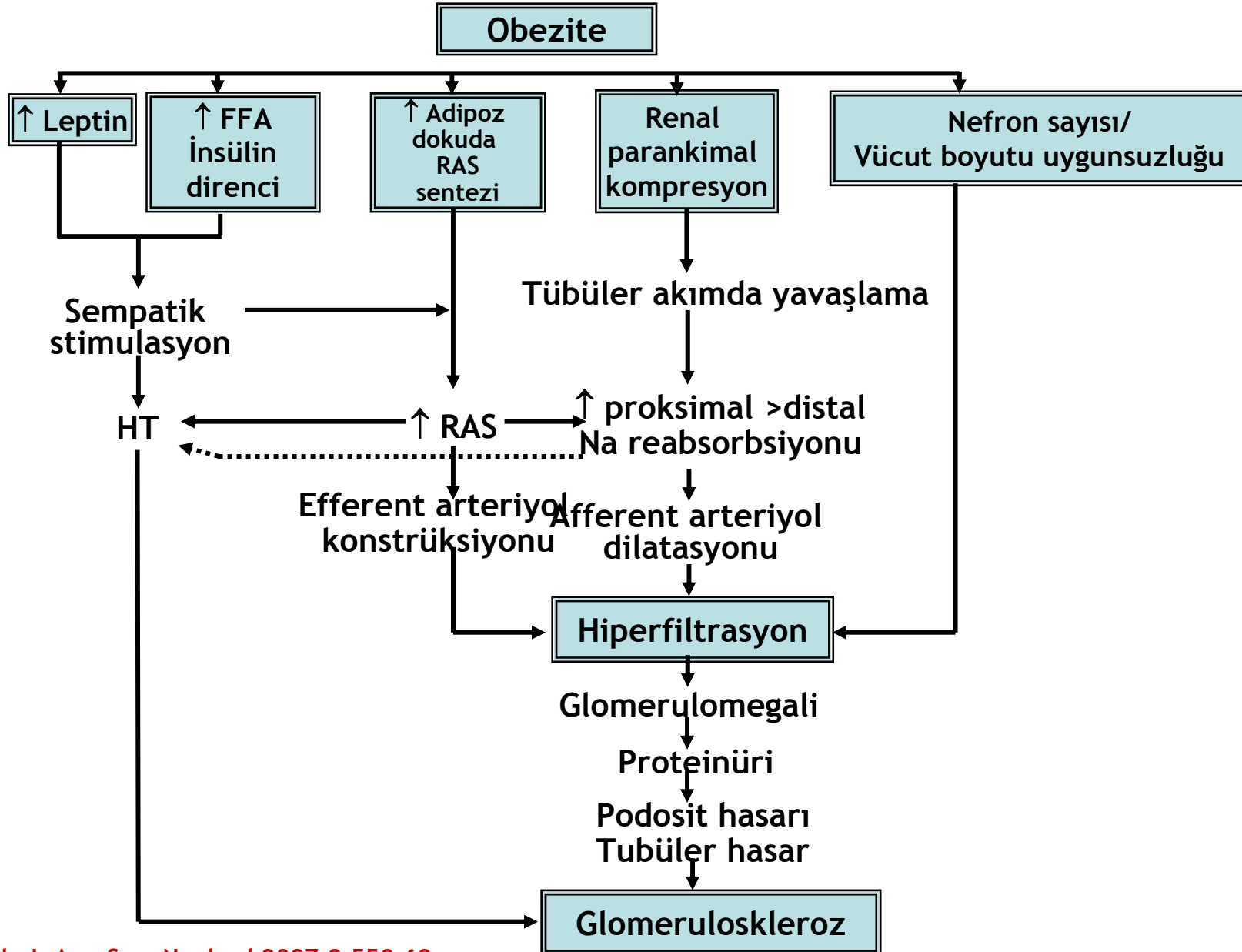




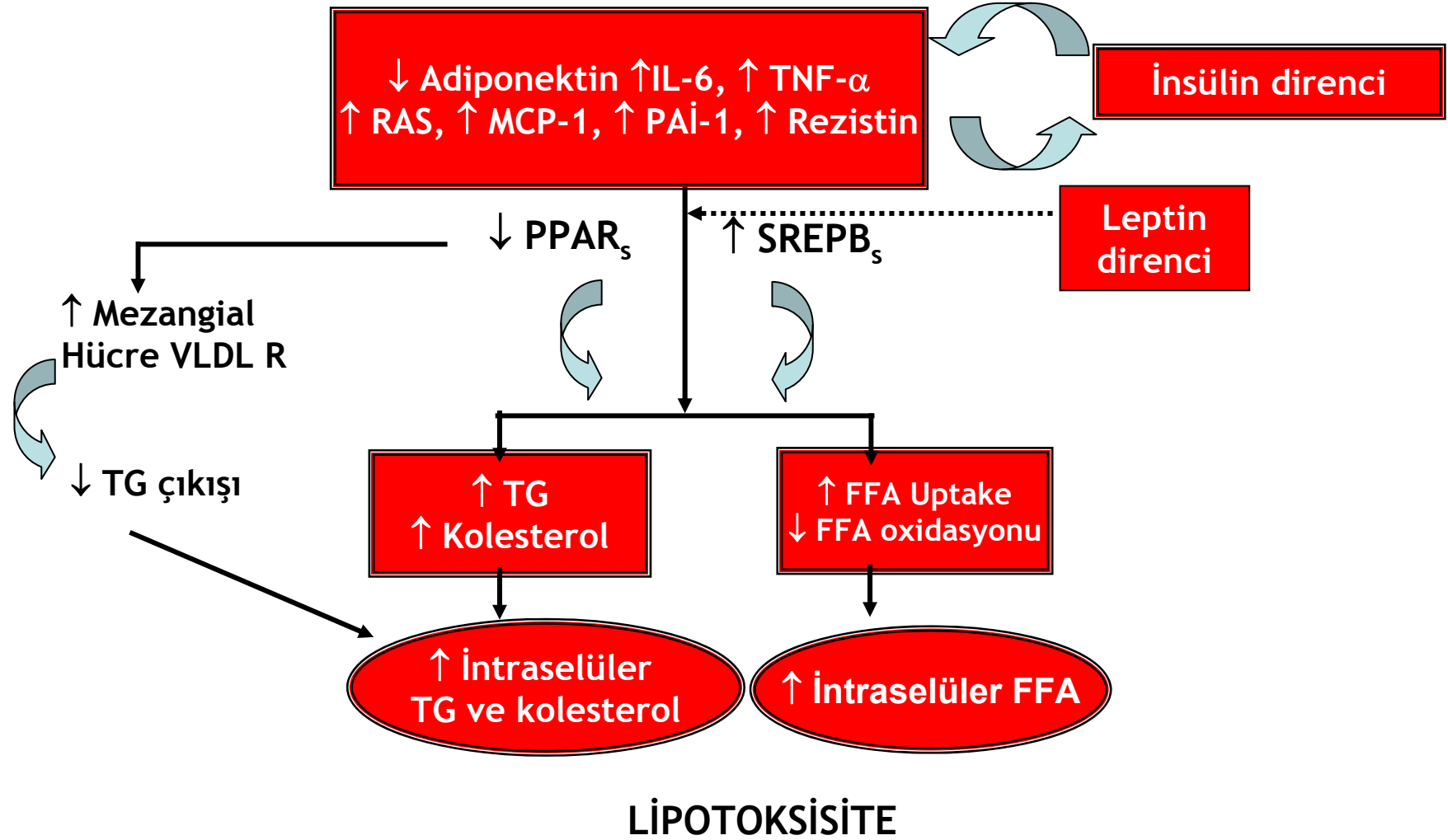




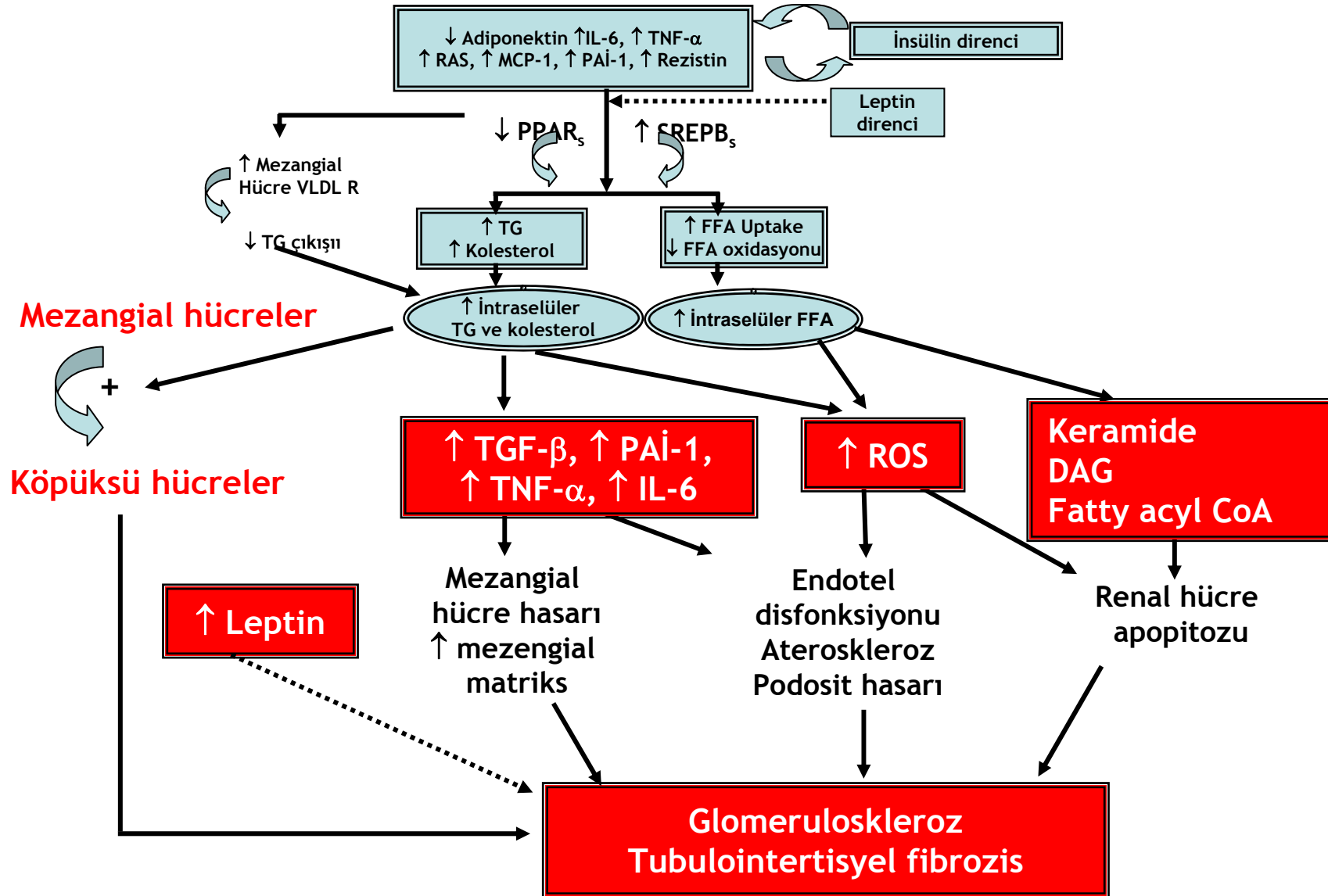
Obezite-Böbrek Hastalığı-Patogenez



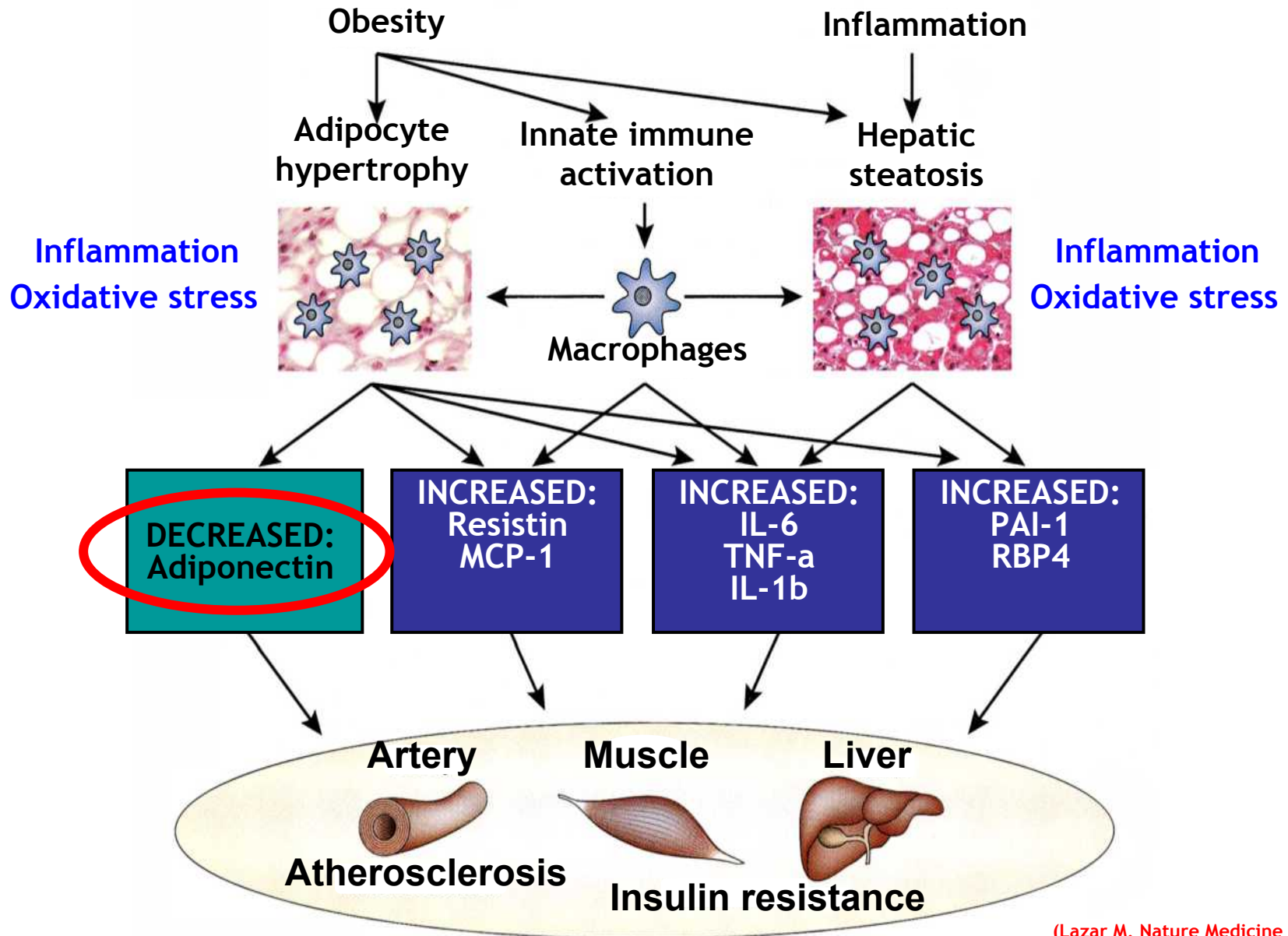
Obezite-Böbrek Hastalığı-Patogenez



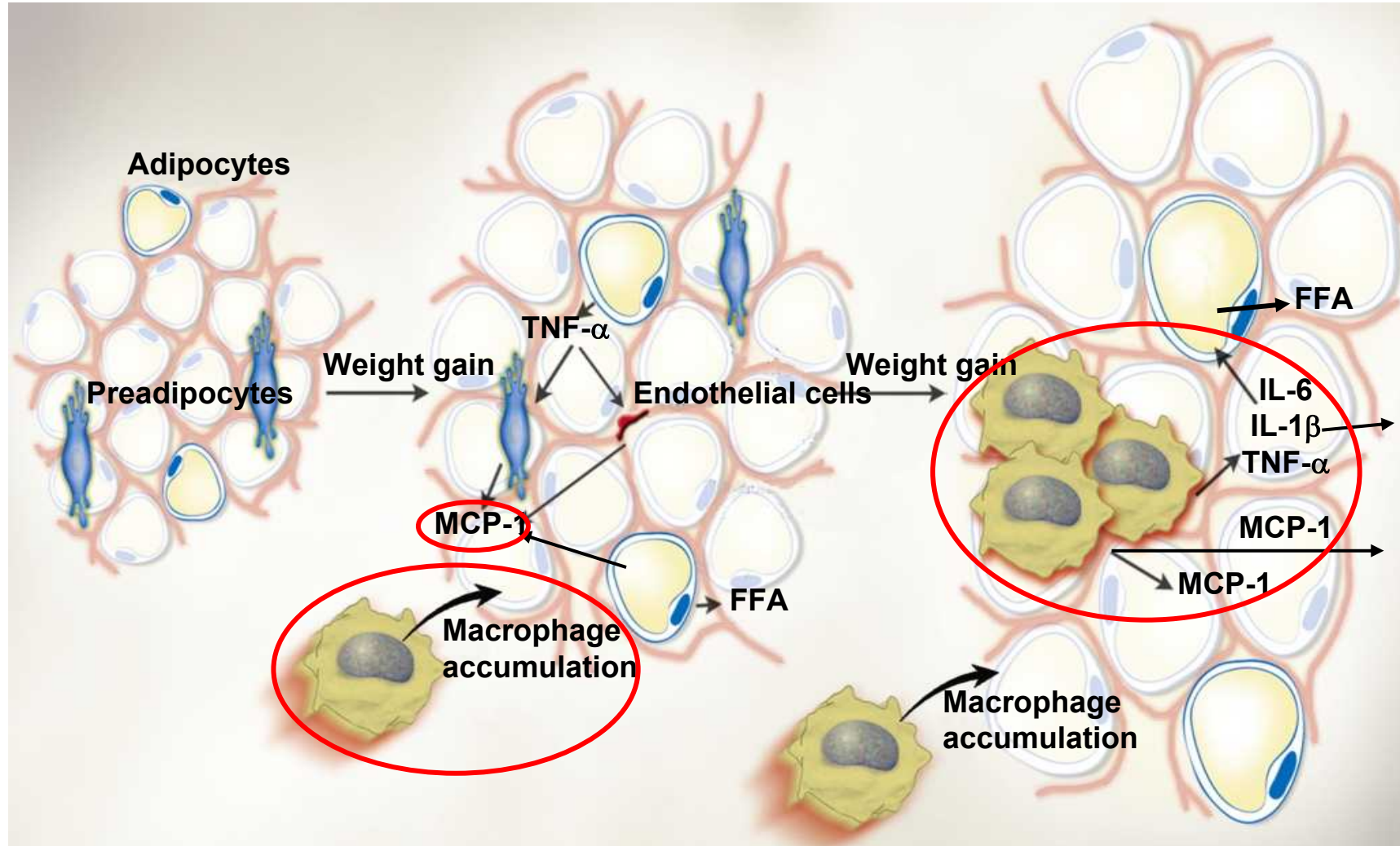
Obezite-Böbrek Hastalığı-Patogenez



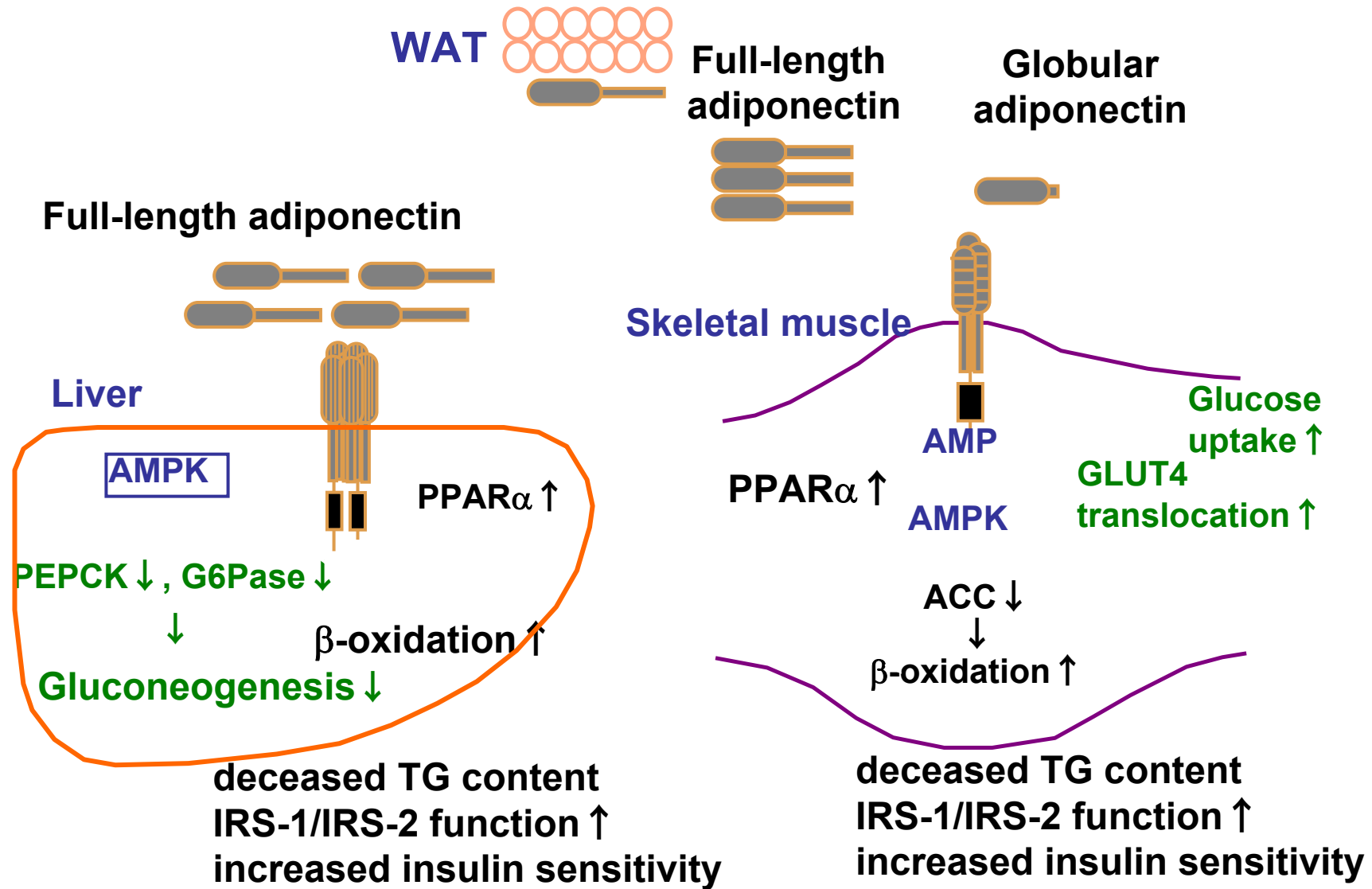
Adipokinler-İnsülin Rezistansı- İnflamasyon ve Ateroskleroz İlişkisi



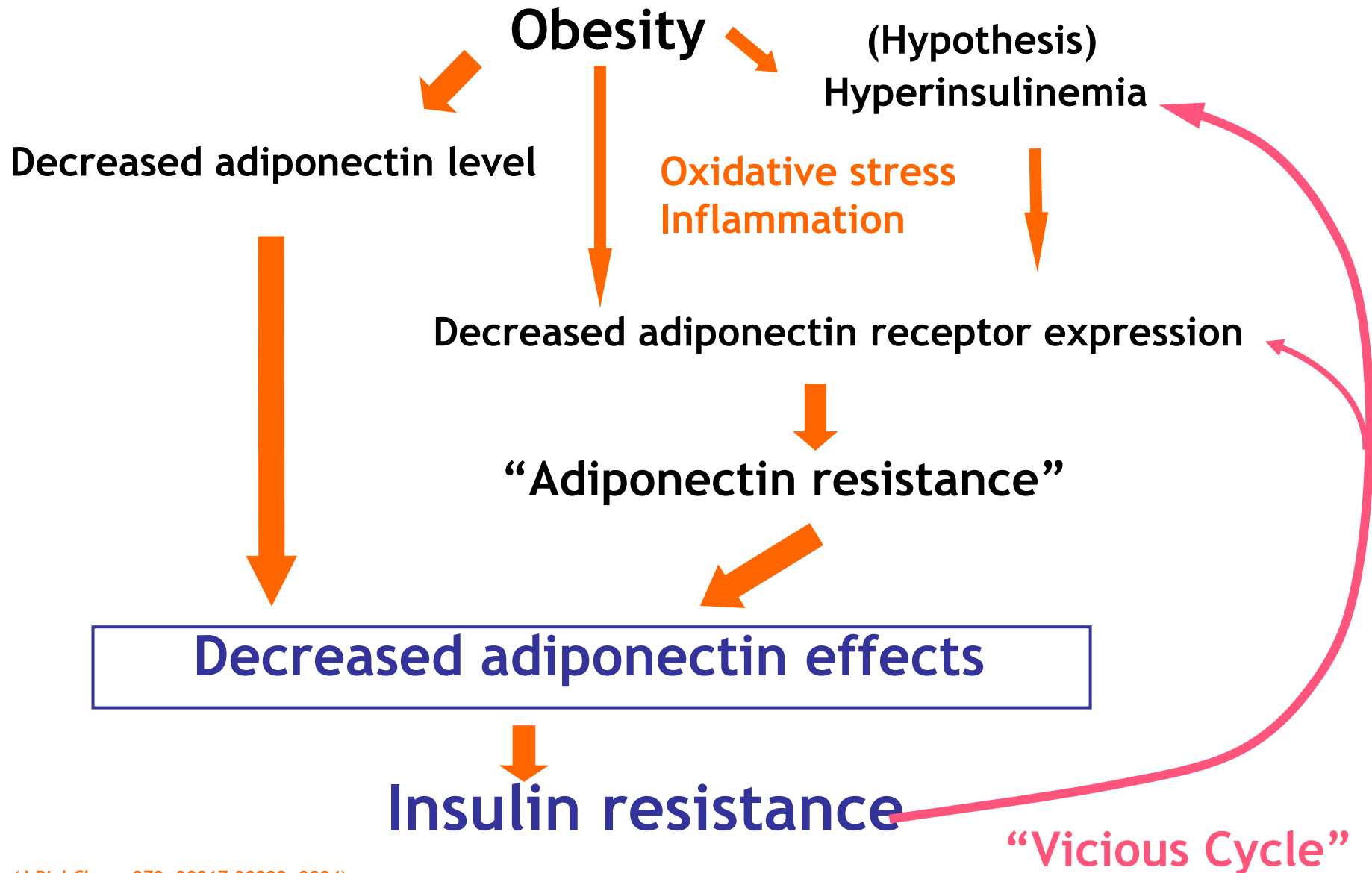
Adipokinler-İnsülin Rezistansı- İnflamasyon ve Ateroskleroz İlişkisi



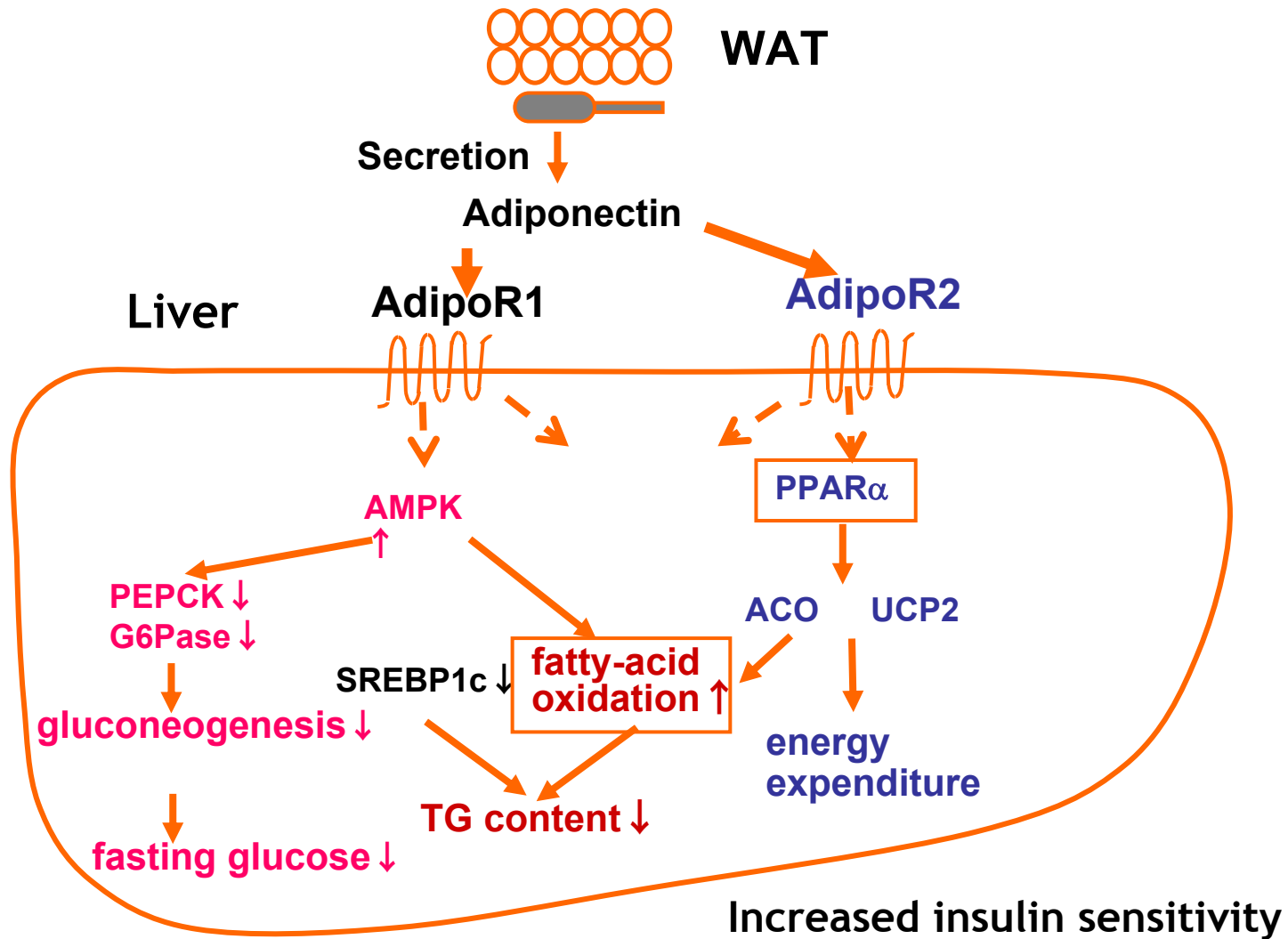
Adiponektinin Karaciğer ve Kas Hücrelerinde Etkisi



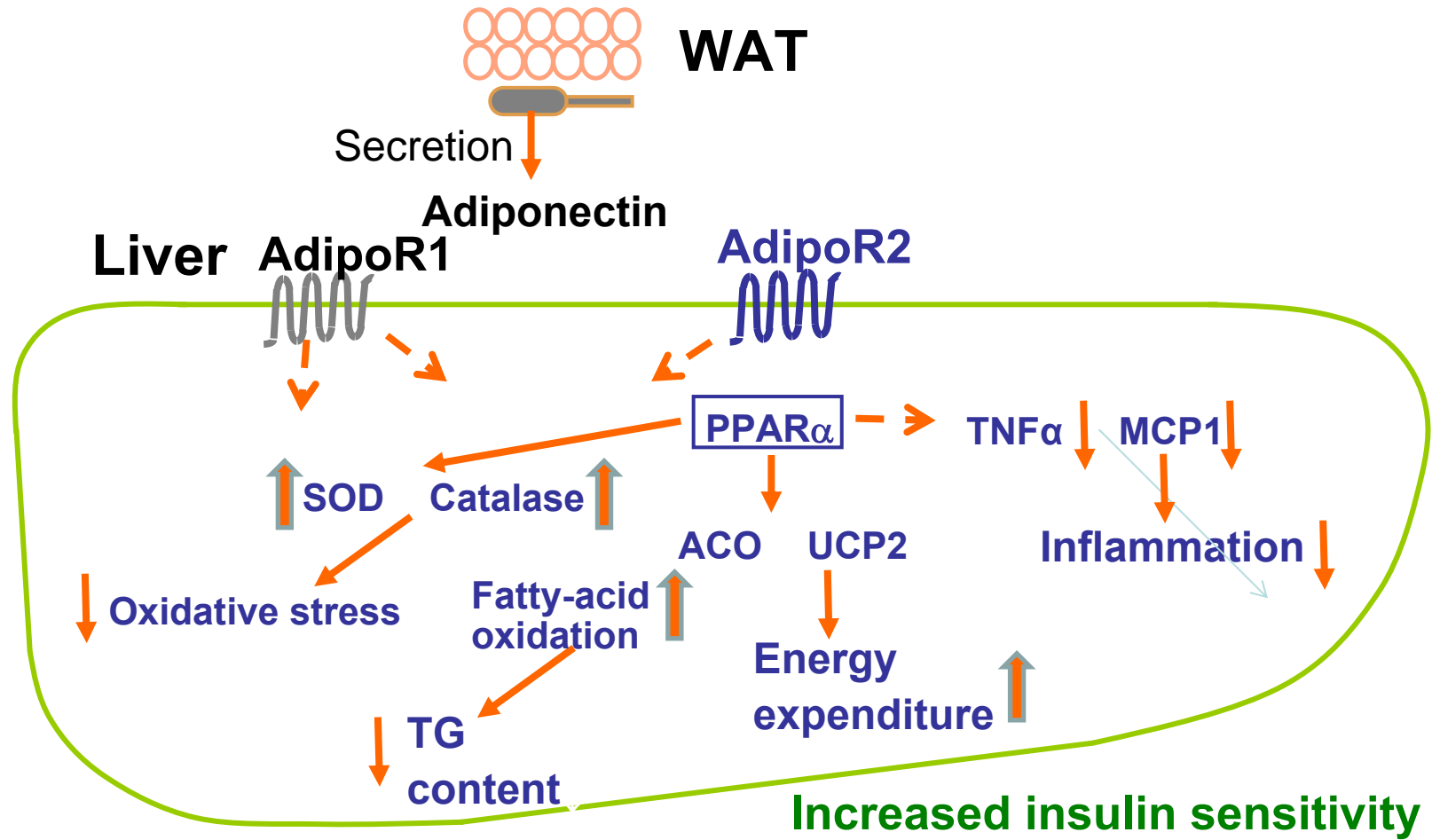
Obezite-Adiponektin ve İnsülin Rezistansı

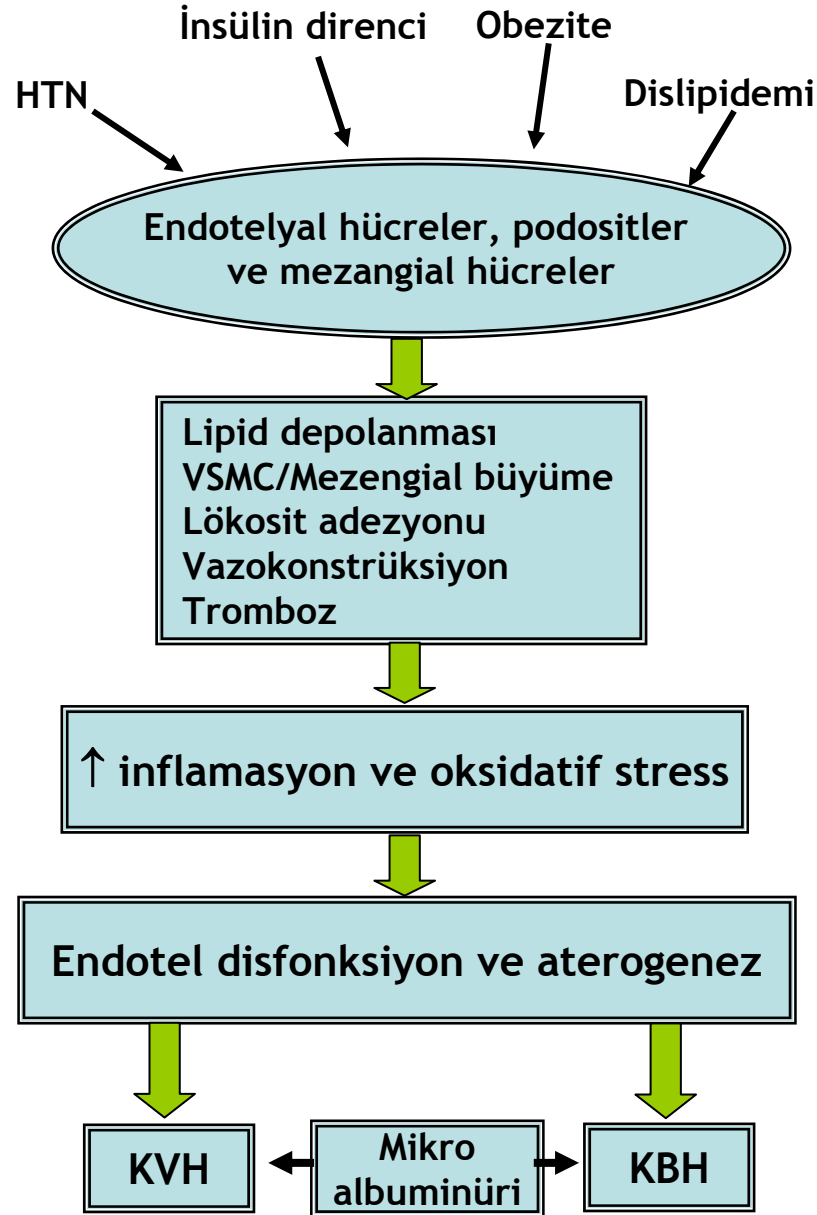


AdipoR1-R2 Reseptörleri ve İnsülin Sensitivitesi

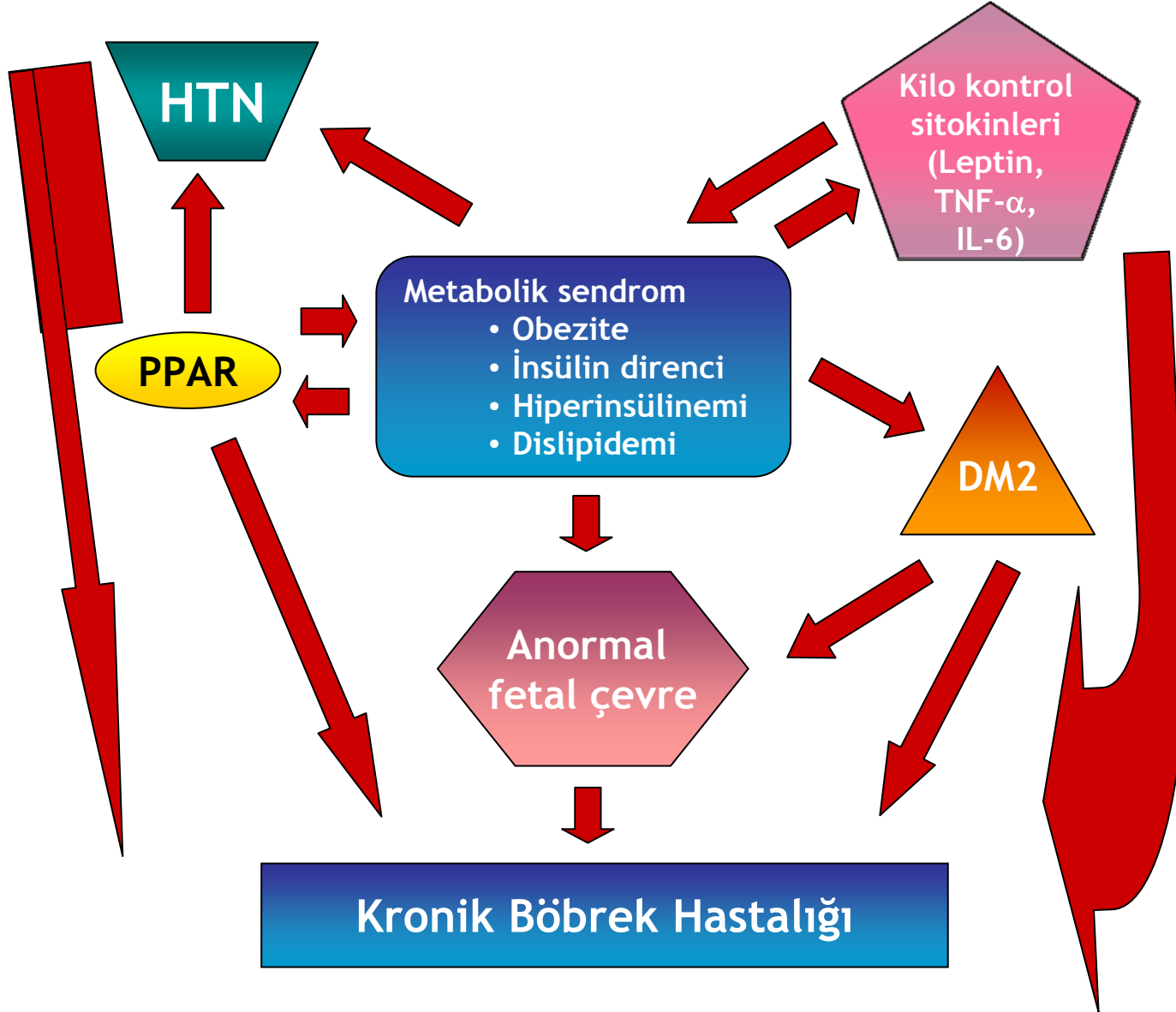


AdipoR2 Reseptörü ve İnflamasyon





Obezite ve Böbrek Hastalıkları



Özet-1

- ▶ Obezite çocukluk ve erişkin çağında renal hasar için bağımsız risk faktörüdür
- ▶ Vücut kitle indeksi arttıkça, metabolik sendrom komponenti sayısı arttıkça renal hasar riski de artmaktadır
- ▶ Renal hasarı belirlemede; santral obeziteyi gösteren bel çevresi, bel-kalça oranı vücut kitle indeksine göre daha değerli olabilir

Özet-2

► Obezite ilişkili renal hasarda:

- Hiperfiltrasyon,
- İnsülin direnci
- İnflamatuvar sitokinler,
- Lipotoksisite
- Endotel disfonksiyonu
- Bazı adipokinler özellikle de adiponektin

patogenezde rol alırlar