Do we know our friends and foes in cardiovascular disease prevention ?

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ATHEROSCLEROSIS – LIPID HYPOTHESIS

- 19th century – Anitschkow – high cholesterol diet feeded rabbits - development of atherosclerotic lessions

- epidemiological data showing clear relationship between LDL-cholesterol and atherosclerosis (Framingham, Seven Countries Study, Munster PROCAM, etc.)

- Brown and Goldstein – Nobel price in 1985 – lipid hypothesis of atherogenesis

ATHEROSCLEROSIS – ONLY LIPIDS ?

- Anitschkow – high cholesterol diet feeded rabbits - rabbits really do not prefer cholesterol...
- atherosclerotic plaques – there is inside only approximately 10-15% of cholesterol...
- there are many people (e.g. Greenland Eskimos) with elevated cholesterol, but not suffering from atherosclerosis...
- on the other hand there are many people with “normal“ cholesterol after AMI or stroke...

NON-ATHEROGENIC HYPERCHOLESTEROLEMIA

- subjects with documented hypercholesterolemia - increased total cholesterol (> 5.0 mmol/l) and LDL cholesterol (>3.0mmol/l)
- very large particles of LDL-cholesterol – not able to transported into arterial wall
- these LDL particles are not prone to oxidation
- subjects with „“such LDL profile“ are not suffering from cardiovascular diseases

Oravec S, et al. Curr Med Chem 2014

ATHEROGENIC NORMOLIPIDEMIA

- subjects with lipid values within “normal range“ - total cholesterol (<4.5 mmol/l) and LDL cholesterol (<1.80mmol/l)
- very small particles of LDL-cholesterol – rapidly transported into arterial wall (higher concentration of apolipoprotein B)
- these LDL particles are more prone to oxidation
- subjects with „“such LDL profile“ are more frequently suffering from cardiovascular diseases

Oravec S, et al. Curr Med Chem 2014

AIR POLLUTION – NOT ONLY RESPIRATORY BUT CARDIOVASCULAR DISEASE RISK AS WELL

LIGHT POLLUTION

Solution ? Pills....

HEAVY LIGHT AND AIR POLLUTION (CANCER, INFARCTION, STROKE, COPD)

NOISE POLLUTION – INCREASED STRESS

HARD WATER OR SOFT WATER ?

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Is it true ?


Which water is the best one ???
PELLEGR
STELLA
BADOIT
SAN BENEDETTO
evian
perrier

HARD WATER OR SOFT WATER ?

- "Experts" recommend even to soften hard water – it is better for machines, no calcium stones

Is it true ?

- soft water – bad taste, bad for human vessels
- concentration of calcium and magnesium is of highly importance
- geographical regions with soft drinking water – higher prevalence of cardiovascular disease
- drinking of soft water may result in "hard vessels"

TABLE OF WATER HARDNESS

Hardness of water	German grades (N°)	Ca and Mg (mmol/l)
very soft	0-4.0	0.7
soft	4.01-8.0	0.71-1.42
medium hard	8.01-12.0	1.43-2.14
hard	12.01-18.0	2.15-3.2
very hard	18.01-30.0	3.21-5.4
extremely hard	> 30.01	> 5.41

The most soft is distilled water – disgusting taste

VERY SOFT WATER – HIGH HEALTH RISKS

- increased incidence of cardiovascular diseases
- possible increased toxicity (frequently poluted with heavy metals)
- sometimes recommended "by experts for detoxication" – associated with life threating hyponatriemia, or other minerals deficit
- moreover, even good drinks could be distasteful (coffee, tea, beer) when soft water was used to be prepared


SAVE WATER!
DRINK
BEER!!

TEA – GREEN OR BLACK, OR NO TEA ?

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TEA – GREEN OR BLACK, OR NO TEA ?

- **“Experts“ recommend green tea, is healthier than black tea. Some do not recommend drinking of tea due to content of caffeine**

Is it true ?

- **there exist several types of tea – white, green, oolong,black...**
- **green tea contains the highest concentration of antioxidants (but almost the same like black tea – difference only 0.9 mmol/l)**
- **black tea contains more broad spectrum of antioxidants like green one**

ANTIOXIDANTS IN TEA (WINE)

Antioxidants	green tea	black tea
catechins	30-42	1-3
teaflavins	-	2-6
simple polyphenols	2	3
other polyphenols	6	23
tanins	3	3
caffeine	3-6	3-6
total antioxidant activity	7.7 mmol/l	6.8 mmol/l

Total antioxidant activity of dry red wine is approx. 8.4 mmol/l

COFFEE – YES OR NO ?
DECAFFEINATED ?

- "1000-times repeated lie becomes true."
- Not only "experts", but too many cardiologists and other doctors recommend to not drink coffee or to drink decaffeinated coffee for people with history of cardiovascular disease

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Is it true ?

- "typical coffee drinkers" are smoking subjects (caffee bars, television, films)
- frequently associated with unhealthy dietary and lifestyle habits

COFFEE – YES OR NO ?
DECAFFEINATED ?

- coffee (up to 3-4 cups of espresso daily) has no effect on blood pressure, arrhythmias
- positive vasodilatory effects on coronary circulation

COFFEE – YES OR NO ?
DECAFFEINATED ?

- Mediterranean diet - espresso coffee (very short contact of coffee with superheated steam – needed coffee machine with high pressure)

- Soluble coffee is something strange for Italians like “ketchup on pizza“ (they will never do so)

- Coffee with caffeine is strong antioxidant

COCOA AND CHOCOLATE

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Is it true ?

- Carl von Linné (1973) Theobromma cacao (theobromma – "food for Gods")
- Panama Indians drinking a lot of cocoa (5-6 cups daily) sweetened with bananas (9-times less CV disease, 17-times less cancer disease like other Panama citizens

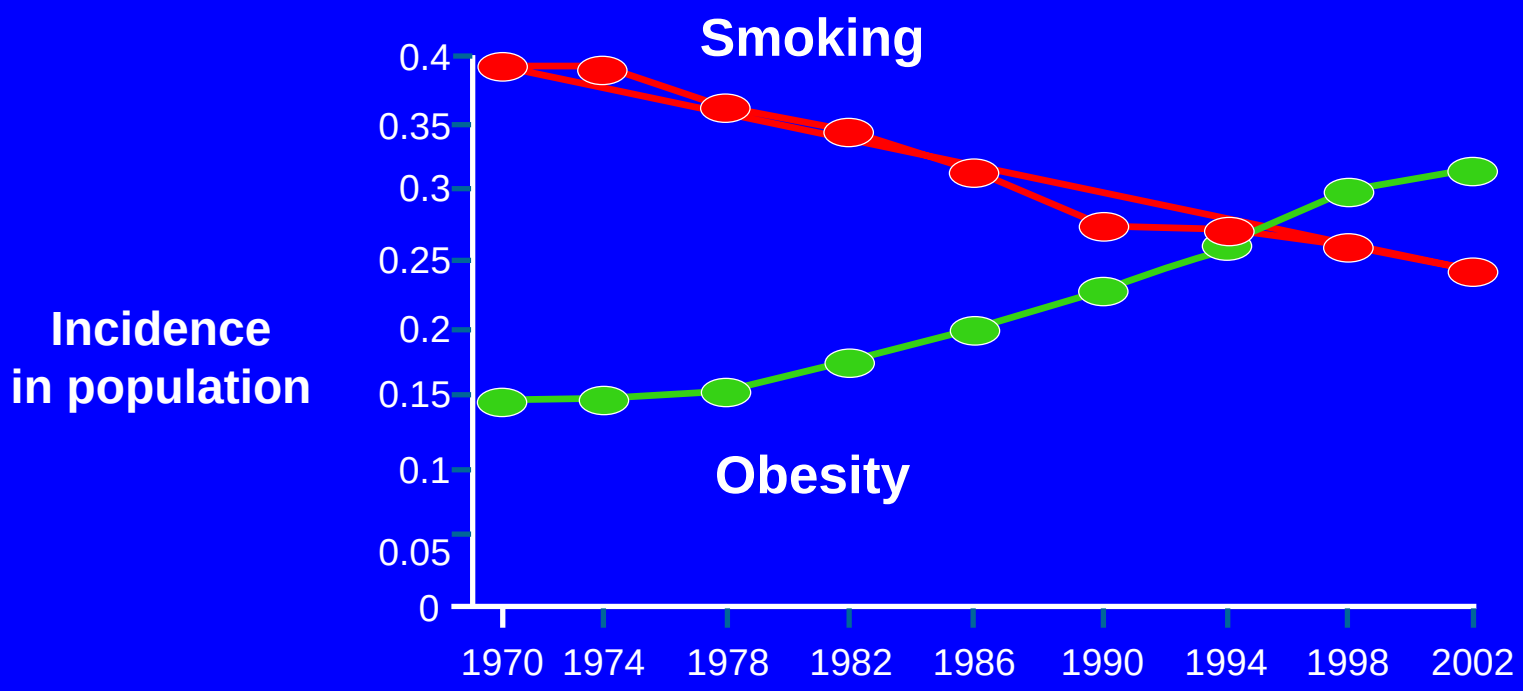
COCOA AND CHOCOLATE

- Van Houten in 1882 – developed hydraulic mangle – decreased content of cocoa butter from 57% to 27% and later on there was no cocoa butter in chocolate !!!
- today – many “chocolates“ are selled and containing no cocoa
- white chocolate - no chocolate
- “chocolates“ frequently contain a lot of margarines – they are proofed against high temperatures, have good sensoric properties, looks like real chocolate and tastes like real chocolate

COCOA AND CHOCOLATE

- chocolates based on margarines containing small ammount of cocoa butter (or none) are associated with higher risk of diabetes type 2
- cocoa butter (or cocoa) is rich in antioxidants, minerals and vitamin D
- healthy chocolate may prevent myocardial infarction and stroke (antiinflammatory effects, effects againts insulin resistance and diabetes type 2, antithrombotic properties)
- healthy chocolate – must contain at least 70 % of cocoa

SMOKING DECREASED – OBESITY INCREASED. GOOD DEAL ???



Gruber J and Frakes M. *J Health Econ.* www.sciencedirect.com.

Obesity "guarantee" bad health, not only development of atherosclerosis

Diseases associated with obesity:

- Hypertension
- Diabetes mellitus type 2
- Dyslipidaemia
- Cardiovascular disease
- Gall-bladder and pancreatic diseases
- Osteoarthritis and osteoarthrosis
- Stroke
- Respiratory diseases (Pickwick sy.)
- Cancer (uterus, breast, colon, prosthatic gland)

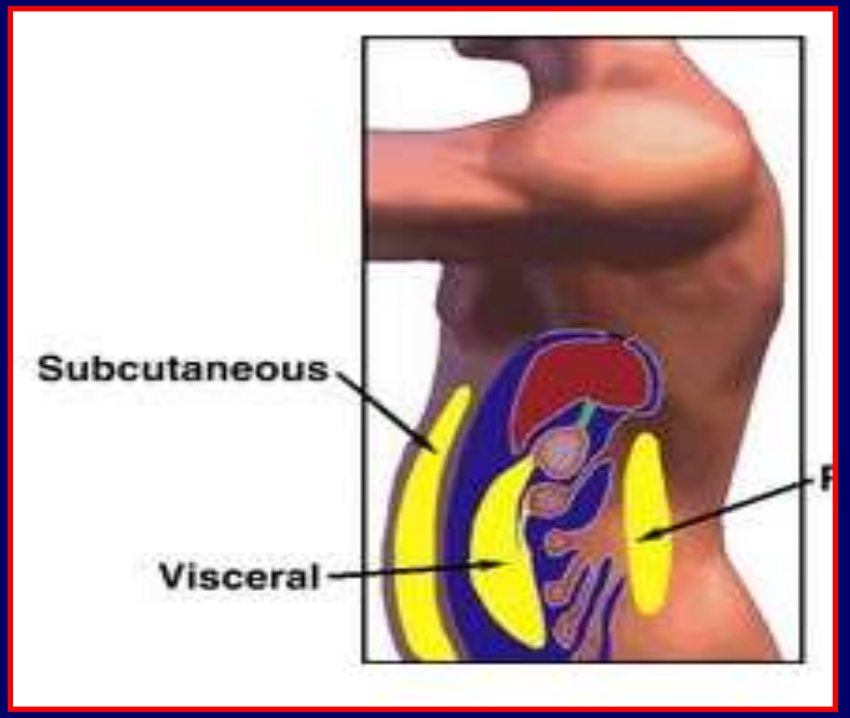
"During evolution was important: eat as much as possible in order to increase chance for survival. Today, many people are dying due to morbid obesity."

– **Dr. Bruce Spiegelman,** Harvard Medical School

Sources: U.S. Department of Health and Human Services. The Surgeon General's call to action to prevent and decrease overweight and obesity: what you can do; 2001.

Underwood A, Adler J, Hand K, Ulick J. What You Don't Know About Fat. *Newsweek*. 2004;144:40-47.

Metabolic syndrome



hypertriglyceridaemic waist

European Guidelines on Cardiovascular Disease Prevention in Clinical Practice
European Journal of Cardiovascular Prevention and Rehabilitation 2003; 10 : S1-

LIPOSUCTION ? MAY RESOLVE THE PROBLEM ?

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YES, but....

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YES, but....

only in association with change of lifestyle

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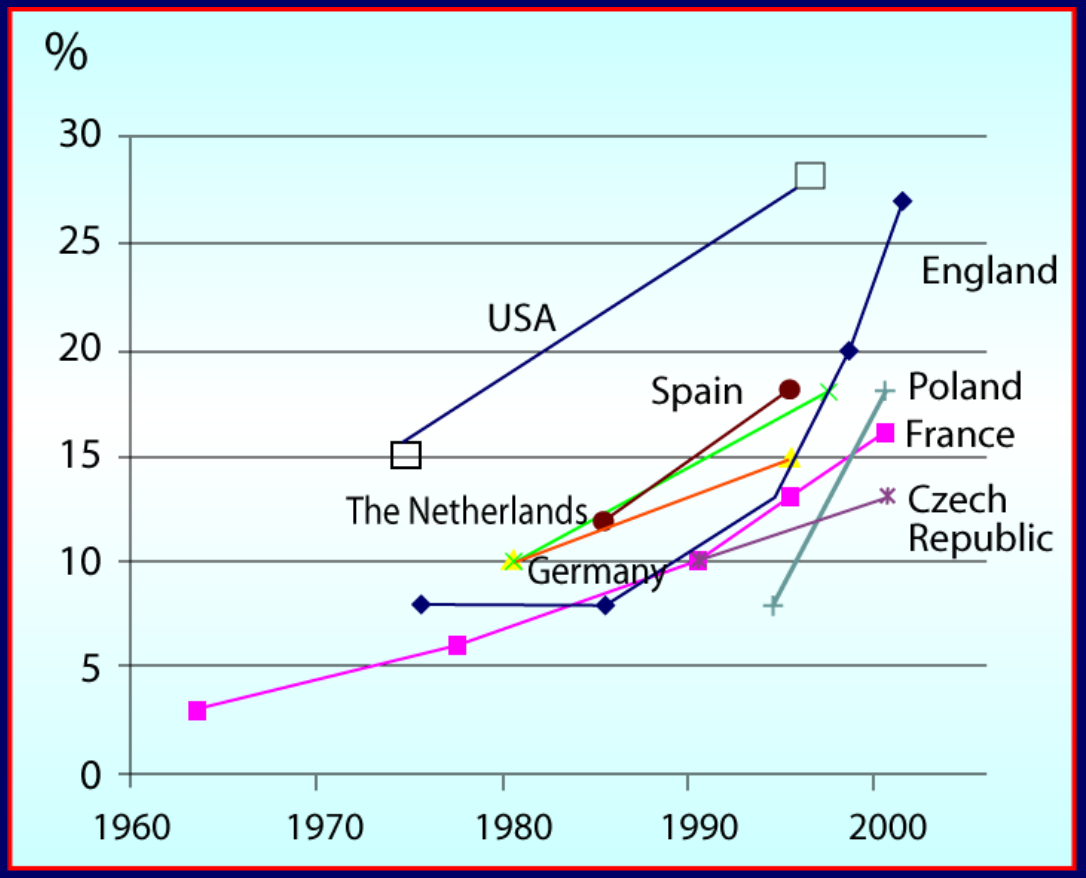
only in association with change of lifestyle

otherwise, visceral fat will be increased

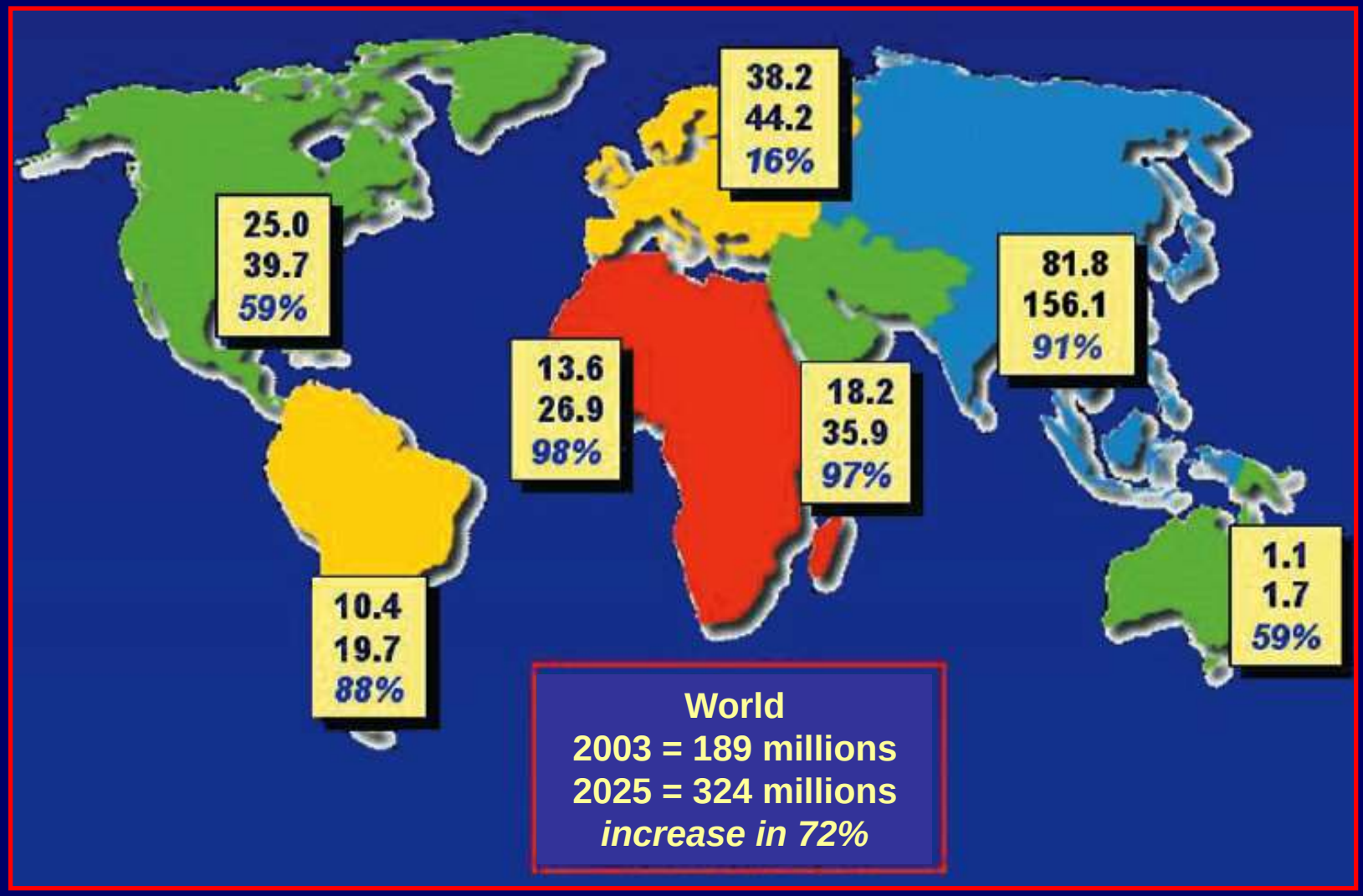
OVERWEIGHT IN CHILDREN USA AND EUROPE

Increasing incidence of overweight in children (5-11 years)



ESTIMATED PREVALENCE OF DIABETES TYPE 2

World-wide epidemy: 2003-2025 (in millions)



Lefèbvre; Rev Med Liège 2005; 60 : 273-277

DIABETES MELLITUS AND CARDIOVASCULAR RISK

- **hyperglycaemia**
- **dyslipidemia**
- **hypertension**

Which parameter is the most important for CV disease prevention ?

DIABETES MELLITUS AND CARDIOVASCULAR RISK

- **hyperglycaemia (3)**
- **dyslipidemia (1)**
- **hypertension (2)**

Uncontrolled dyslipidemia is responsible for majority of cardiovascular events not hypertension, not blood glucose control

CONCLUSIONS

- **treatment of dyslipidemia remained the basic pillar in preventive cardiology**
  (both pharmacological and non-pharmacological)

- **novel diagnostic markers are needed**
  (size of LDL particles, apoB, hs CRP, etc.)

- **healthy lifestyle**

  (daily exercise and eating of recognized healthy foods)

CONCLUSIONS II.

- perform physical activity at least 4-5 times weekly
- drink hard water, do not avoid coffee, black or green tea and chocolate (alcohol – “drink responsibly“ – preferably red wine)
- avoid food containing margarines (high ammount of unhealthy n-6 PUFA, trans forms of fatty acids)
- do not smoke, prevent obesity and diabetes
- eat a lot of vegetables, fruit and food containing n-3 PUFA

THANK YOU !