LA PREVENCIÓN CARDIOVASCULAR A LO LARGO DE LA VIDA

Madrid, 2 de Diciembre de 2015
SEXTAS JORNADAS CIENTÍFICAS DEL
CEIPC
Comité Español Interdisciplinario para la Prevención Cardiovascular

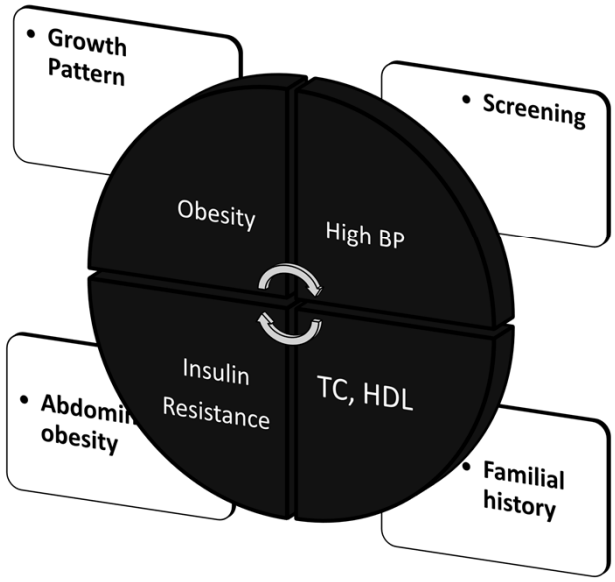
El Continuo Cardiovascular a lo Largo de la Vida

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Instituto de Salud Carlos III

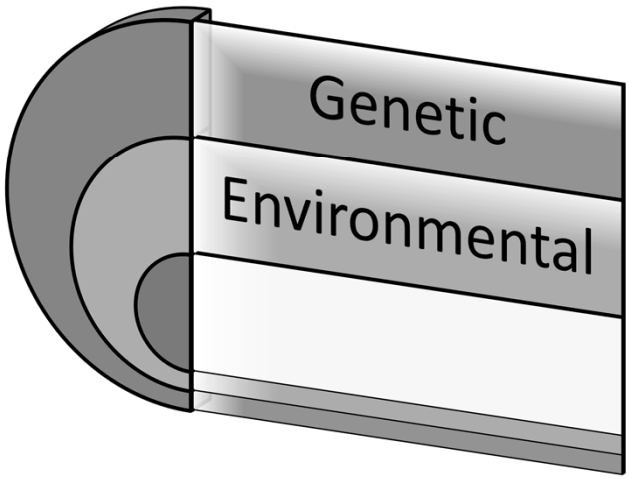
Roots of Cardio-Metabolic risk factors

- Cardiovascular complications occurring in adults find their roots in risk factors operating early in life
- Subtle alterations in risk factors can be observed in youths
- The presence of these risk factors foresees future increments to abnormal levels

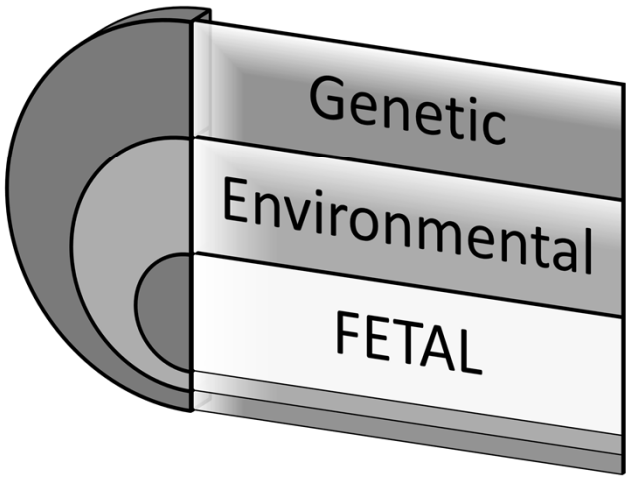
Cardio-Metabolic risk factors detected in children and adolescents



Factors related to Cardio-Metabolic phenotype



Factors related to Cardio-Metabolic phenotype



THE LANCET
Volume 334, Issue 8663, 9 September 1989, Pages 577–580
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WEIGHT IN INFANCY AND DEATH FROM ISCHAEMIC HEART DISEASE

D.J.P Barker, C Osmond, P.D Winter, B Margetts, S.J Simmonds

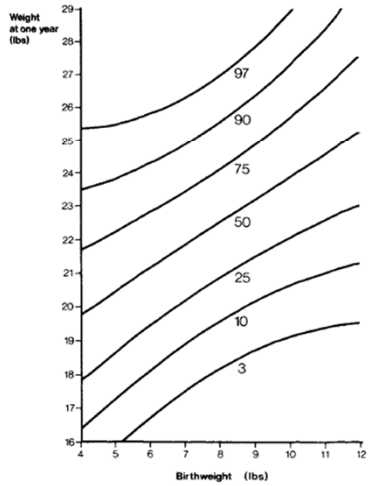
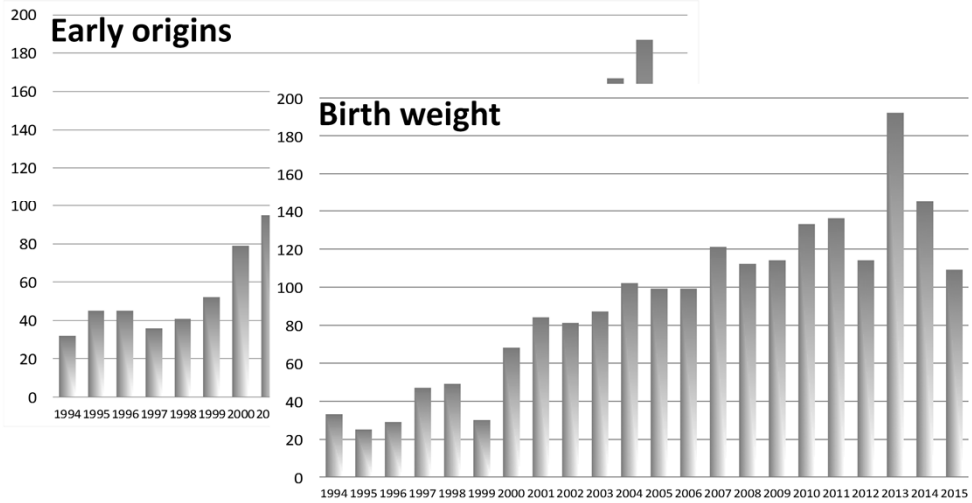


Fig 2—Percentiles of weight at one year according to birthweight in men who were breast fed.

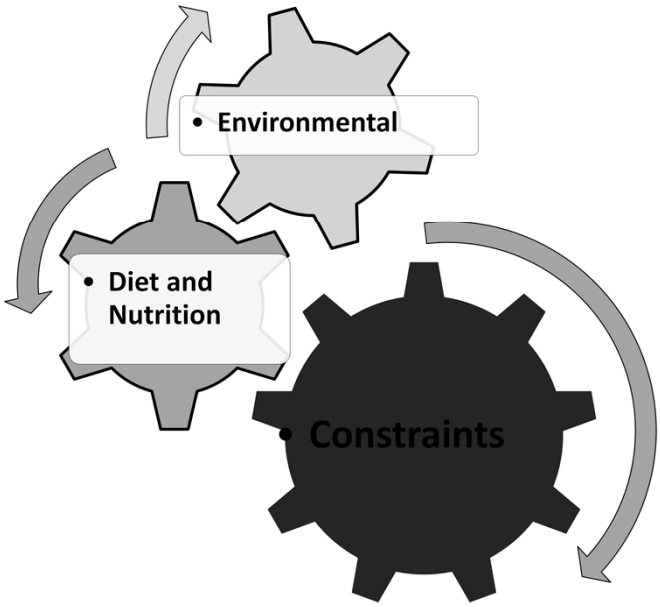
TABLE II—SMRs FOR ISCHAEMIC HEART DISEASE ACCORDING TO WEIGHT AT ONE YEAR AND METHOD OF FEEDING

Weight (pounds)	Breast fed	Bottle fed
⩽18	112 (33)	105 (4)
19–20	81 (71)	79 (5)
21–22	100 (154)	72 (9)
23–24	69 (85)	97 (13)
25–26	61 (40)	144 (9)
⩾27	38 (9)	89 (2)
Total	81 (392)	94 (42)

Publications related to Cardio-Metabolic risk in PubMed



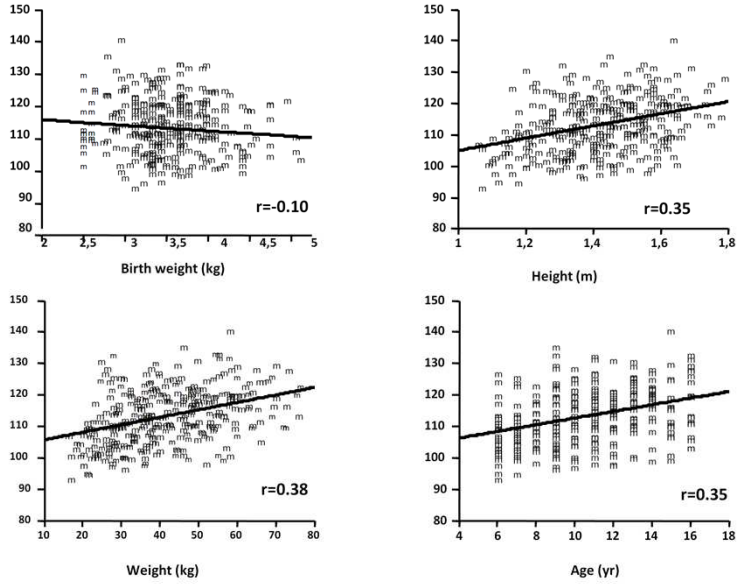
Maternal factors influencing fetal growth and development



Relationship between Birth Weight and Awake Blood Pressure in Children and Adolescents in Absence of Intrauterine Growth Retardation

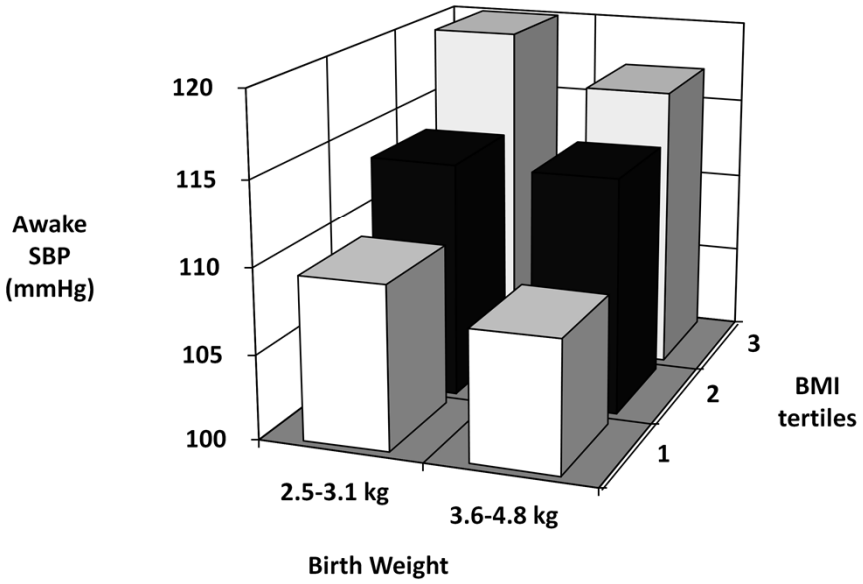
Am J Hypertens 1996;9:787-794

Relationship between awake systolic BP, birth weight, age, current weight and height



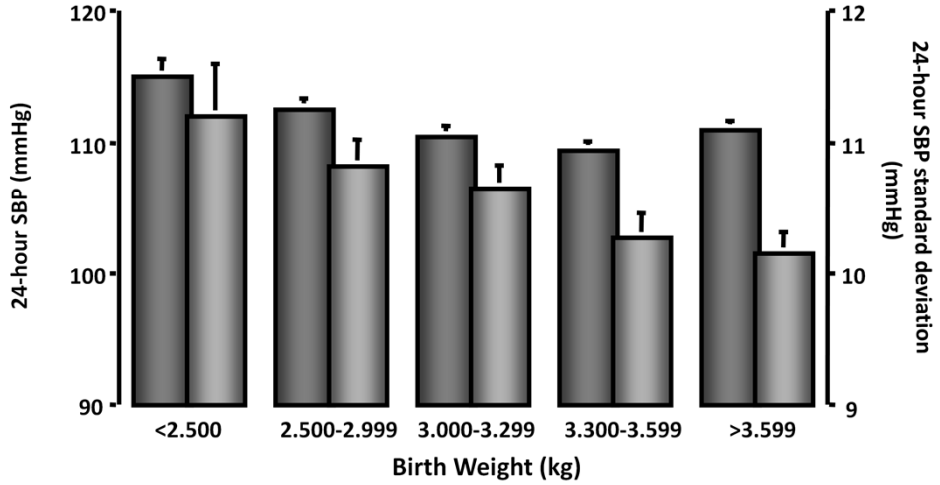
Lurbe E et al. Am J Hypertens 1996;9:787-794

Birth weight and awake SBP in children and adolescents



Lurbe E et al. Am J Hypertens 1996;9:787-794

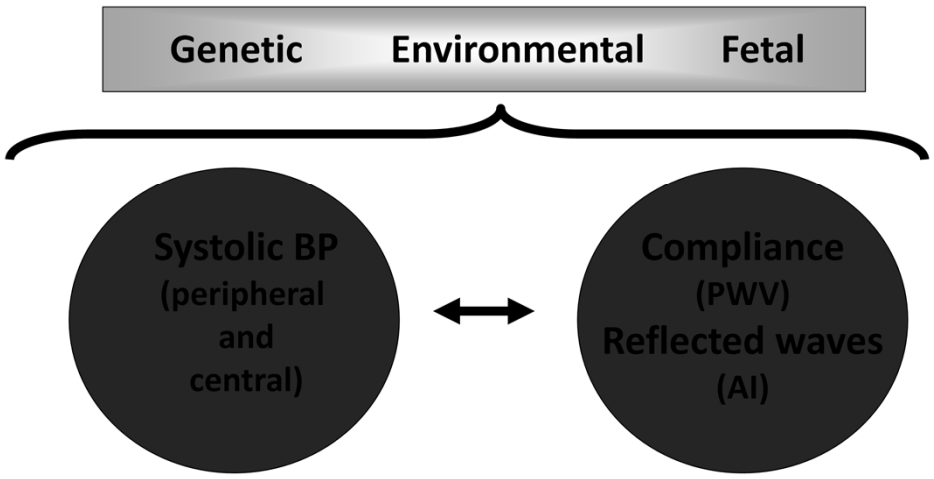
24-hour systolic BP averages and variability grouped by birth weight



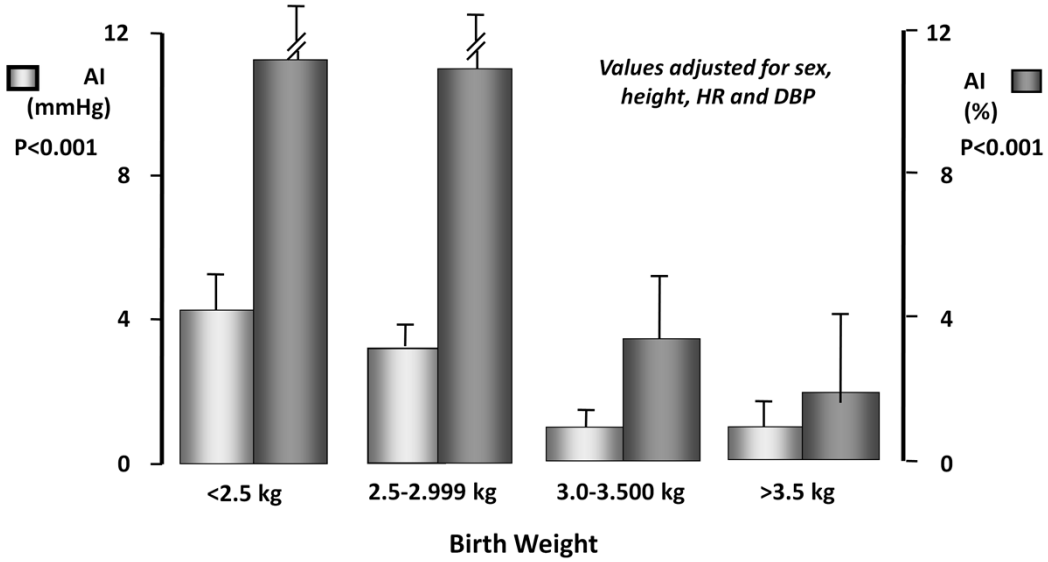
Values adjusted for sex, age, current weight and height

Lurbe E et al. Hypertension 2001;38:389-393

Arterial phenotype in children and adolescents

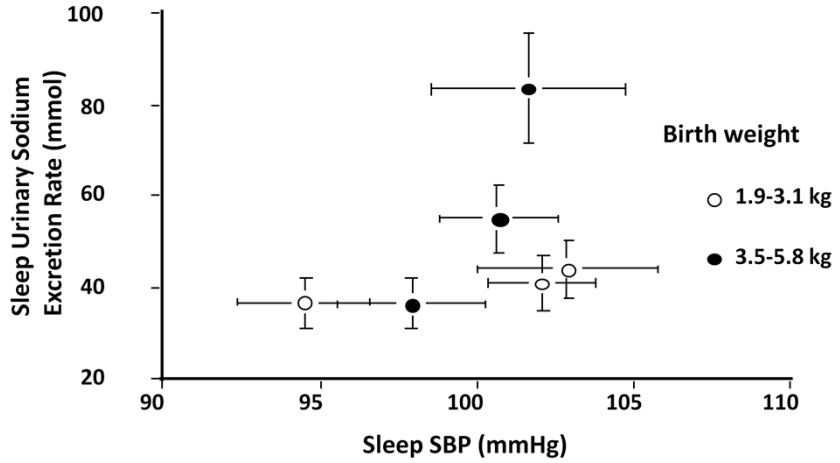


Augmentation Index grouped by birth weight



Lurbe E et al. Hypertension 2003;41:646-650

Sleep BP and UNa excretion

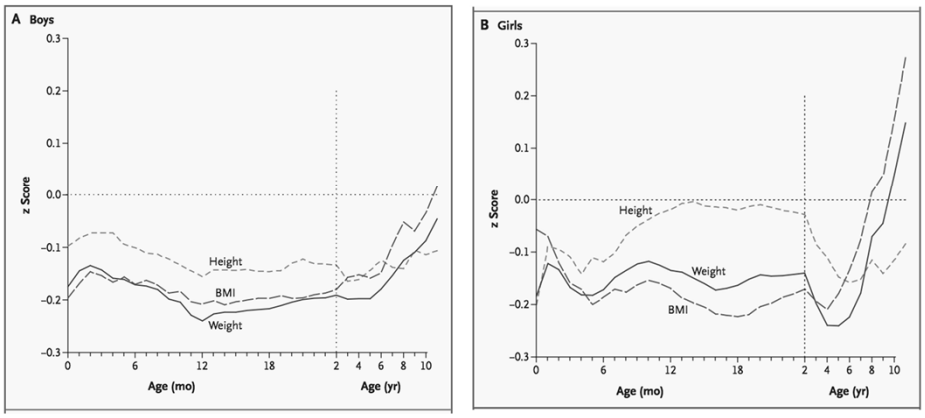


Lurbe E et al. Hypertension 1998;31:546-551

Vascular phenotype of children with the lowest birth weight

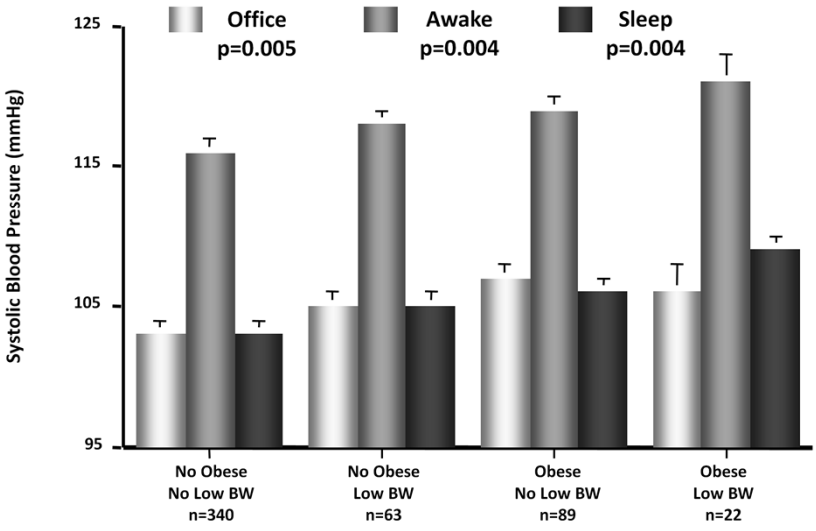
- ✓ Tend to have the highest Pulse Pressure and Augmentation Index, expressing an early impairment in aortic elasticity and/or higher peripheral resistance
- ✓ Have an increase in BP variability
- ✓ May have a restricted ability to excrete sodium

Trajectories of growth among children who have coronary events as adults



Barker DJ et al. N Engl J Med 2005;353:1802-1809

Impact of birth weight and obesity on SBP in Spanish adolescents



Values adjusted for sex, current age and height

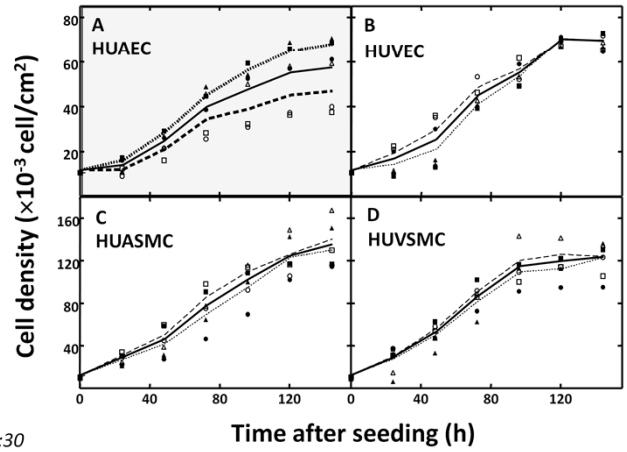
Lurbe E et al. Hypertension 2009;53:912-917

Umbilical cord arteries and vein cell cultures and birth weight

HUAEC, HUVEC, HUASMC, and HUVSMC:
from individuals of birth weight <2.8 kg or >3.5 kg

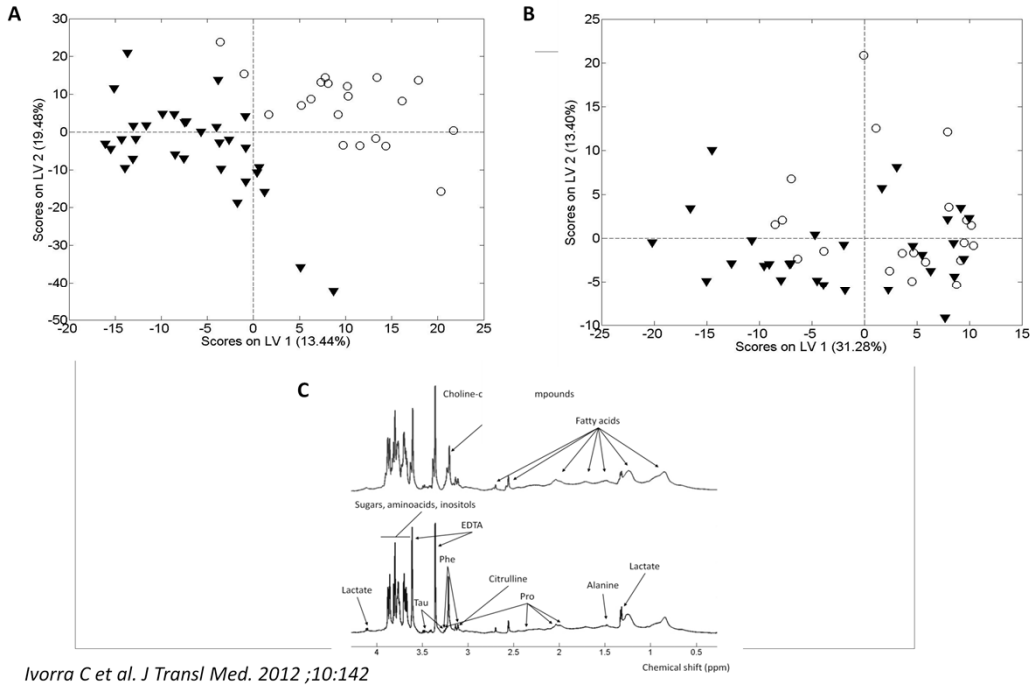
- ✓ no difference in cell viability (>95%)
- ✓ no difference in cell culture growing speed

- ✓ Difference in cell density at confluence (only observed in HUAEC)



Martin de Llano JJ et al. J Transl Med 2009;7:30

PCA of the metabolomic plasma profile in newborns and mothers



Ivorra C et al. J Transl Med. 2012 ;10:142

Conclusions

- The early postnatal period is a critical window for individuals who have experienced a growth insult in fetal life, reflected by small size at birth
- Birth weight and postnatal gain exert independent influences on cardio-metabolic parameters at 5 years of age
- Metabolic alterations manifested by the highest values of insulin, HOMA index, triglycerides, uric acid, and lowest HDL, are present even as early as 5 years of age
- Research in umbilical cords may help in understanding the impact of intrauterine life on cardiovascular disease later in life