www.jpnim.com Open Access eISSN: 2281-0692
Journal of Pediatric and Neonatal Individualized Medicine 2015;4(2):e040249
doi: 10.7363/040249
Published online: 2015 Oct 26

Abstracts

Selected Abstracts of the 11th International Workshop on Neonatology

FROM THE WOMB TO THE ADULT

CAGLIARI (ITALY) · OCTOBER 26TH-31ST 2015

The Workshop has been organized with the patronage of the Italian Society of Neonatology (SIN), the Italian Society of Pediatrics (SIP), the Italian Society of Perinatal Medicine (SIMP), The Italian Federation of Pediatricians (FIMP), the Union of European Neonatal and Perinatal Societies (UENPS), the Union of Mediterranean Neonatal Societies (UMENS), the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC), and lastly the Italian National Observatory of Residents in Paediatrics (ONSP).

WORKSHOP'S PRESIDENTS

Vassilios Fanos (Cagliari, Italy), Michele Mussap (Genoa, Italy), Antonio Del Vecchio (Bari, Italy), Bo Sun (Shanghai, China), Dorret Boomsma (Amsterdam, the Netherlands), Gavino Faa (Cagliari, Italy), Antonio Giordano (Philadelphia, USA)

WORKSHOP'S HONORARY COMMITTEE

S. Bernardini (Rome, Italy), D.I. Boomsma (Amsterdam, the Netherlands), G. Buonocore (Siena, Italy), E. Burgio (Bruxelles, Belgium; Arezzo, Italy), M. Burlea (Bucarest, Romania), G. Castaldo (Naples, Italy), I. Cetin (Milan, Italy), G. Chiamenti (Verona, Italy), G. Corsello (Palermo, Italy), J.R. De Langhe (Ghent, Belgium), G.C. Di Renzo (Perugia, Italy), G. Donzelli (Florence, Italy), C. Fabris (Turin, Italy), M. Ferrari (Milan, Italy), A. Giordano (Philadelphia, USA), G. Guerrera (Genoa, Italy), M. Hod (Tel Aviv, Israel), L. Indinnimeo (Rome, Italy), G.B. Melis (Cagliari, Italy), L. Memo (Belluno, Italy), G. Mercuro (Cagliari, Italy), G. Monni (Cagliari, Italy), C. Moretti (Rome, Italy), J.-C. Picaud (Lyon, France), D. Pisano (Cagliari, Italy), M.G. Privitera (Rome, Italy), L. Ramenghi (Genoa, Italy), C. Romagnoli (Rome, Italy), L. Scarpa (Cagliari, Italy), A. Staiano (Naples, Rome), M. Stronati (Pavia, Italy), B. Sun (Shanghai, China), S. Vendemmia (Aversa, Italy), A. Villani (Rome, Italy), M. Yurdakök (Ankara, Turkey), Luc Zimmermann (Maastricht, the Netherlands)

WORKSHOP'S INTERNATIONAL FACULTY

D. Boomsma (Amsterdam, the Netherlands), G. Buonocore (Siena, Italy), E. Burgio (Bruxelles, Belgium; Arezzo, Italy), M.J. Bennett (Philadelphia, USA), M. Burlea (Bucarest, Romania), L. Cataldi (Rome, Italy), G. Corsello (Palermo, Italy), J.R. De Langhe (Ghent, Belgium), G. Faa (Cagliari, Italy), V. Fanos (Cagliari, Italy), M. Ferrari (Milan, Italy), A. Giordano (Philadelphia, USA), L. Gortner (Homburg, Germany), D. Grapov (Los Angeles, USA), G. Guerrera (Genoa, Italy), M. Hod (Tel Aviv, Israel), C. Maretti (Lugano, Switzerland), G.B. Melis (Cagliari, Italy), W.W. Minuth (Regensburg, Germany), C. Moretti (Rome, Italy), F. Mosca (Milan, Italy), M. Mussap (Genoa, Italy), J.-C. Picaud (Lyon, France), M.G. Privitera (Rome, Italy), S. Rezzi (Lausanne, Switzerland), C. Romagnoli (Rome, Italy), M. Somaschini (Lugano, Svizzera), M. Spraul (Rheinstetten, Germany), M. Stronati (Pavia, Italy), B. Sun (Shanghai, China), K. Yurdakök (Ankara, Turkey), M. Yurdakök (Ankara, Turkey), Luc Zimmermann (Maastricht, the Netherlands)

SATELLITE MEETINGS' PRESIDENTS

Irene Cetin (Milan, Italy), Giampietro Chiamenti (Verona, Italy), Joris R. Delanghe (Ghent, Belgium), Antonio del Vecchio (Bari, Italy), Gian Carlo Di Renzo (Perugia, Italy), Gavino Faa (Cagliari, Italy), Vassilios Fanos (Cagliari, Italy), Maurizio Ferrari (Milan, Italy), Antonio Giordano (Philadelphia, USA), Gian Benedetto Melis (Cagliari, Italy), Michele Mussap (Genoa, Italy), Giovanni Ottonello (Cagliari, Italy), Denis Pisano (Cagliari, Italy), Melania Puddu (Cagliari, Italy), Bo Sun (Shanghai, China), Murat Yurdakök (Ankara, Turkey)

Pancreas: mesenchyme with stem/ progenitor cells and initial differentiation of pancreatic gland near a vein (**Fig. 5**, arrow).
Kidney: the niche composed by subcapsular stem/ progenitor cells surrounding ureteric bud and vesicle (**Fig. 6**).
Adrenal gland: the niche of stem/progenitor cells sited in between the kidney and adrenal gland (**Fig. 7**, arrows).
Prostate: stem/progenitor cells close to the prostatic gland (**Fig. 8**).
Esophagus: stem/progenitor cells nearby the squamous epithelium (**Fig. 9**).
Thyroid: mesenchyme with stem/progenitor cells surrounding thyroid follicles (**Fig. 10**).
Pituitary: this pictures show the initial transformation of stem/progenitor cells in glandular adenohypophysis (**Fig. 11**, arrow).
Skeletal muscle: stem/ progenitor cells adjacent to immature muscular fibers with syncytial aspects (**Fig. 12**, arrow).

CONCLUSIONS

Our study of a 12 week-old human fetus, clearly shows that each organ of the developing human organism is characterized by peculiar and specific stem cell niches. Differences among niches regarded both the architecture and the cell components. Besides, structures in different differentiation stage can be easily recognized in all the examined organs as well as vessels and primitive mesenchyme, suggesting the developing organogenesis in the specific gestational age evaluated in our study. All niches and all stem/ progenitor cells are strictly and directly related with the developing structures in different differentiation stage, vessels and mesenchyme since organogenesis requires organization, order and specific feedbacks.

REFERENCES

[1] Fanos V, Loddo C, Puddu M, Gerosa C, Fanni D, Ottonello G, Faa G. From ureteric bud to the first glomeruli: genes, mediators, kidney alterations. Int Urol Nephrol. 2015;47(1):109-16.

[2] Sanna A, Fanos V, Gerosa C, Vinci L, Puddu M, Loddo C, Faa G. Immunohistochemical markers of stem/progenitor cells in the developing human kidney. Acta Histochem. 2015;117(4-5):437-43.

ABS 110

POST-NATAL CATCH-UP GROWTH IN SARDINIAN INFANTS WITH INTRAUTERINE GROWTH RETARDATION

M.G. Clemente[1], P.M. Galasso[1], G. Capobianco[2], M.G. Sanna[3], L. Argiolas[4], M.G. Olzai[3], R. Antonucci[1]

[1]Pediatric Clinic, [2]Obstetric and Gynecologic Clinic, [3]Neonatology, Neonatal Intensive Care Unit and Neonatal Section, Azienda Ospedaliero Universitaria Sassari, Sassari, Italy

[4]Primary Care Pediatrician, Sassari, Italy

INTRODUCTION

Recent studies have shown that infants with intrauterine growth retardation (IUGR) undergo catch-up growth during infancy.

AIM

The aim of this study was to evaluate the growth during the first year of life in a group of IUGR infants born in a single Maternal-Infant Unit in North Sardinia.

METHODS

A retrospective case-control study was performed on the clinical data of 24 infants, classified into two groups: twelve IUGR infants (group A) and 12 appropriate for gestational age control infants (group B). The auxological parameters of weight (W), height (H) and head circumference (HC) of group A were compared to those of group B infants at 5 time intervals from birth to the 12th month of age. The Student t-test was used for statistical analysis, considering significant a value of $p < 0.05$.

RESULTS

The significant difference present at birth between group A and group B infants for all the auxological parameters considered (W, mean 1,846 vs 3,170 g, $p < 0.0001$; HC, 30.09 vs 34.41 cm, $p < 0.0001$; H mean 43.36 vs 49.36 cm, $p < 0.0001$), showed a progressive, rapid and significant reduction during the first year of life, with final values of $p = 0.02$ for W (W, mean 7,861 vs 9,165 g), $p = 0.04$ for HC (HC, mean 43.47 vs 45.68) and p = ns for H (H, mean 72.58 vs 76.53 cm) at 12 months of life.

CONCLUSIONS

The majority of infants born IUGR in our series underwent a significant catch-up growth during the first 12 months of life. Further studies focused on improving our knowledge on the causes of IUGR will help to develop measures for prevention of the IUGR and for individualized treatments.

ABS 111

METABOLOMIC STUDY OF AMNIOTIC FLUID IN GESTATIONAL DIABETES

F. Palmas[1], L. Barberini[2], A. Noto[3], C. Fattuoni[1], V. Fanos[3], A. Dessì[3], M. Albanesi[4], M. Zaffanello[4]

[1]Department of Chemical and Geological Sciences, University of Cagliari, Cagliari, Italy
[2]Department of Public Health, Clinical and Molecular Medicine, University of Cagliari, Cagliari, Italy
[3]Department of Surgical Sciences, Neonatal Intensive Care Unit, Neonatal Pathology, Puericulture Institute and Neonatal Section, University of Cagliari, Cagliari, Italy
[4]Department of Life and Reproduction Sciences, Pediatric section, University of Verona, Verona, Italy

INTRODUCTION

Gestational diabetes (GD) occurrence is increasing in pregnant women belonging to most ethnic groups, showing different rates depending on the different ethnicity. In particular, while Caucasians seem to be less affected by this condition, Asians are characterised by the highest incidence rate [1]. Notably, also other variables such as obesity may influence the predisposition toward this pathology. The reason why GD is of clinical relevance is its association with higher risks of adverse perinatal, pregnancy, and delivery outcomes; indeed, type II diabetes incidence increases more than seven-fold within 5-10 years after pregnancy for women which experienced GD [1]

MATERIALS AND METHODS

Study design and population

A preliminary retrospective cohort study was conducted on 14 pregnant women; 7 healthy, and 7 GD affected subjects. Amniotic fluid was collected from all pregnant women through amniocentesis at 15-16th week, hence written informed consent was obtained from each woman undergoing invasive procedures.

Sample preparation

AF samples were thawed at room temperature and vortex mixed to homogenize. 200 µL were transferred in Eppendorf tubes (1.5 mL) and treated with 400 µL of acetone for protein precipitation. The mixture was vortexed for 30 s and centrifuged (1,400 rpm for 10 min). 400 µL of supernatant were transferred in glass vials and evaporated to dryness overnight in an Eppendorf vacuum centrifuge. 60 µL of a 0.24 M solution of methoxylamine hydrochloride in pyridine was added to each vial, samples were vortex mixed and left to react for 17 h at room temperature. Then 80 µL of MSTFA (N-Methyl-N-trimethylsilyltrifuoroacetamide) were added and left to react for 1 h at room temperature. The derivatized samples were diluted with hexane (100 µL) just before GC-MS analysis.

GC-MS analysis

Samples were analyzed using a Agilent 5975C interfaced to the GC 7820 equipped with a DB-5ms column (J & W), injector temperature at 230°C, detector temperature at 280°C, helium carrier gas flow rate of 1 ml/min. The GC oven temperature program was 90°C initial temperature with 1 min hold time and ramping at 10°C/min to a final temperature of 270°C with 7 min hold time. 1 µL of the derivatized sample was injected in split (1:20) mode. After a solvent delay of 3 minutes mass spectra were acquired in full scan mode using 2.28 scans/s with a mass range of 50-700 Amu.

Data analysis

Each acquired chromatogram was analyzed by means of the free software AMDIS [2] that identified each peak by comparison of the relative mass spectra and the retention times with those stored in an in-house made library comprising 255 metabolites. Other metabolites were identified using NIST08 (National Institute of Standards and Technology's mass spectral database) and the Golm Metabolome Database (GMD) [3]. Through this approach 97 compounds were detected and quantified. AMDIS analysis produced an Excel data matrix to be treated for data analysis.

Statistical analysis

Data matrix was processed through multivariate analysis, exploiting MetaboAnalyst 3.0 (http://www.metaboanalyst.ca) PLS-DA strategy. Calculations highlighted some VIP metabolites as discriminant for the two different phenotypes: hippuric acid, stearic acid, glutamic acid, and palmitic acid. Such compounds were then used to determine which canonical biological pathways were influenced the most by the pathological occurrence.

RESULTS AND CONCLUSIONS

PLS-DA analysis showed significant changes in some important metabolites as hippuric acid, stearic acid, glutamic acid, and palmitic acid between the two groups under study. These metabolites can be defined as "hubs" of the differential network of the two groups. Finally, metabolomics proved to be a powerful tool also for the amniotic fluid characterization of several pathological conditions with a remarkable amount of information about the fetal and maternal health. Our preliminary GD metabolomics analysis of amniotic fluid highlights the contribution of the phenylalanine metabolism and fatty acid biosynthesis pathways.

REFERENCES

[1] Persson M, Winkvist A, Mogren I. Lifestyle and health status in a sample of Swedish women four years after pregnancy: a comparison of women with a history of normal pregnancy and women with a history of gestational diabetes mellitus. BMC Pregnancy Childbirth. 2015;15:57.