is considered an effective screening test. However, the technique cannot distinguish between isobaric compounds, thus contributing to some false positive results. One such compound is C5-acylcarnitine in the in the identification of isovaleric acidemia (IVA) in the MS/MS profile. To report and contrast the findings of two newborns with C5-acylcarnitine elevations in newborn screening (NBS).

**Methods:** Blood collected on Guthrie card from newborns between 24-72 hours of life is analyzed by MS/MS. C5-acylcarnitine and its related ratios are measured in DBS sample to identify at risk newborn.

**Results:** Newborn A: DBS sample C5: 7.96 µmol/L (normal <0.50), C5/C0: 0.99 (normal <0.025), C5/C3: 16.1 (normal <0.40); Plasma acylcarnitines profile: C5: 9.42 µmol/L (normal 0.06-0.29). Urine organic acid profiles showed marked elevations of isovalerylglucose (IVG), ketone bodies and lactate. This profile is consistent with a patient presenting with a diagnosis of IVA.

Newborn B: DBS sample C5: 0.84 µmol/L (normal <0.50), C5/C0: 0.041 (normal <0.025), C5/C3: 0.46 (normal <0.40); Despite the abnormal plasma acylcarnitines profile (C5: 4.38 µmol/L, normal 0.06-0.29), the urine acylglycine profile was normal [IVG: 1.02 mg/g Cr (normal 0.3-14.3 mg/g); 2-MBG: 0.16 mg/g Cr (normal: 0.3-7.5 mg/g)]. A 2nd plasma acylcarnitine showed a lower C5 level (1.49 µmol/L) and a repeat urine organic acid profile was normal; no IVG and 2-MBG detected. Mother’s (Newborn B) plasma acylcarnitines and urine organic acid profiles were normal, ruling out a possible maternal condition. Moreover, it was confirmed that mother and newborn were not on any antibiotics or steroids, which have been previously reported as the causal agents of falsely elevated C5-acylcarnitine. Further investigation revealed mom was using Mustela Nursing Comfort Balm which contained neopentanoate, a compound demonstrated by Boemer et al. [2014] as the causal agent for the false elevation of C5-acylcarnitine in NBS. The elevated C5 levels in the newborn’s plasma samples appear to correspond to the timing of the feed with the blood draw (i.e., the high C5 plasma acylcarnitine result (4.38 µmol/L) corresponds to a blood sample taken within minutes of a feed and the second sample was collected several hours (>2 hours) after the feed (C5: 1.49 µmol/L). Withdrawal of Comfort Balm use eliminated the biochemical derangements in Newborn B and he is clinically well at 10 months.

**Conclusions:** Neopentanoate in the form of an emollient can cause a C5 false positive result in NBS.

**Keywords:** Newborn screening (NBS); C5-acylcarnitine; isovaleric academia (IVA)

**Cite this abstract as:** Yeo SJ, Tan ES, Saumya J, Poh S, Lim J. A case of exogenous C5-acylcarnitine giving rise to a false positive result in newborn screening (NBS). Ann Transl Med 2015;3(S2):AB093. doi: 10.3978/j.issn.2305-5839.2015.AB093

**AB094. Efficacy of combined preimplantation genetic diagnosis (PGD) and preimplantation genetic screening (PGS) cycles—early results**

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**Abstract:** Preimplantation genetic diagnosis (PGD) using PCR allows couples where one or both carry a hereditary single gene disorder to avoid having a child with that disorder. It can also be an effective therapeutic tool in curing an existing affected sibling through tissue matched cord blood stem cell transplant. However early preimplantation embryos have significant levels of chromosomal aneuploidy increasing with maternal age. Recent PGS technologies such as comparative genome hybridization (CGH) allow screening of all 24 chromosomes in the early embryo, allowing selective single embryo transfer (eSET) with significantly increased IVF implantation rates and significantly decreased miscarriage rates. We discuss early results on the efficacy of using PGD-PCR in combination with PGS-CGH (combined cycle) in couples who present for PGD for hereditary single gene disorders. PGD-PCR patients have a family specific test established, with the test components multiplexed and checked for reliability on single maternal cumulus cells. Patients having combined cycle had the individual test components checked on existing whole genome amplification (WGA) products and, if unreliable, reverted back to a standard PGD-PCR test/cycle only. Couples had an ovarian
stimulation cycle, harvested eggs were fertilized using intracytoplasmic sperm injection (ICSI), and resultant normally fertilized embryos cultured to day 5 and day 6 blastocyst stage. Suitable blastocysts were biopsied with assistance of a near-infra-red laser. The 1-6 cells obtained had their DNA extracted and either PCR amplified using the established multiplexed PGD-PCR test (PGD-PCR cycle) or WGA amplified (combined cycle). From 2007-2014, 109 couples presented for PGD-PCR for 16 different familial single gene disorders, predominantly beta-thalassemia (61/109) or alpha-thalassemia (25/109). In 2012 we introduced PGS-CGH for 24 chromosome screening of infertility couples, and soon after offered PGD-PCR patients the option of a combined PGS-CGH and PGD-PCR cycle; to date 19 patients had requested the combined cycle. For PGD-PCR only, 97 patients had 154 cycles with 85 embryo transfers (114 embryos). 57/85 (67%) were clinically pregnant with an implantation rate of 50%. For requested combined cycles, 5/19 patients (all alpha-thalassemia) failed the WGA check and reverted to PGD-PCR test/cycle only. 11/14 had 14 cycles with 8/14 cycles freeze-all (with no transfers to date) and 4 embryo transfers (5 embryos). 4/4 (100%) were clinically pregnant with an implantation rate of 80%. Early results, while low numbers, indicate offering patients presenting with a hereditary single gene disorder the option of having all 24 chromosomes screened prior to implantation may significantly increase their chance of a healthy pregnancy.

Keywords: Preimplantation genetic diagnosis (PGD); preimplantation genetic screening (PGS); array comparative genome hybridization (aCGH)

**AB095. Comparison pregnancy of day 6 fresh blastocyst and day 5 frozen-thawed blastocyst transfer following array comparative genome hybridization (aCGH)**

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Abstract: Advances in assisted reproductive technologies (ART) have benefitted many infertile couples. However while many modern technologies were applied in ART, pregnancy rates remained lower than expected. Some studies have suggested that successful embryo implantation depends on many factors including genetic anomalies such as aneuploidy. While pre-implantation genetic screening (PGS) using fluorescent in situ hybridization (FISH) was introduced around 20 years ago to screen for aneuploidy, it failed to improve pregnancy rates and reduce miscarriage rates. FISH had technical limitations, some inaccuracies, and could only screen up to 8-11 chromosomes. Recent more modern technology, array comparative genome hybridization (aCGH), has been shown to significantly improve pregnancy rates and decrease miscarriage rates by allowing the detection of aneuploidy in all 23 pairs of chromosomes, and allowing the transfer of euploid embryos. Couples have an ovarian stimulation, eggs are collected and fertilized using intracytoplasmic sperm injection (ICSI), and any normally fertilized embryos are cultured to the blastocyst stage. Suitable blastocysts are biopsied on either day 5 or day 6 of embryo culture with the assistance of a near-infra-red laser, and the removed cells amplified in a whole genome amplification (WGA), fluorescently labelled, hybridized and scanned using the BlueGnome (Illumina) 24Sure CGH microarray system. Advances in aCGH means the total process from biopsy to result can be done overnight, allowing for a suitable embryo from a day 5 biopsy to have potential fresh embryo transfer on day 6 of culture. Alternatively, following biopsy, embryos can be frozen immediately and euploid embryos transferred in a subsequent frozen-thaw cycle. We retrospectively compared pregnancy outcomes of good quality blastocysts biopsied and analysed using aCGH following by fresh embryo transfer on day 6 (n=50) versus frozen embryo transfer of