Introduction

Bisphenol A (BPA) is a chemical compound used in the manufacture of polycarbonate plastics and epoxy resins composing a variety of everyday products. BPA was considered a weak environmental estrogen-mimicking compound, binding to both estrogen receptor (ERα) and ERβ, with 10-fold higher affinity to ERβ.

BPA also acts through a variety of mechanisms other than mimicking, enhancing or inhibiting the activity of endogenous estrogens. BPA exposure negatively impacts ovarian response, number of fertilized oocytes, blastocyst formation and implantation in women undergoing in vitro fertilization (IVF) procedures.

Aim of the study

The aim of the study was to determine BPA levels in polycystic ovary syndrome (PCOS) women and those with tubal factor infertility who underwent IVF and to investigate their effects in critical endpoints of IVF, the possible association with oocytes number and IVF outcome.

Material and Methods

Eighty two women in reproductive age (41 with PCOS and 41 normo-ovulatory with TF infertility) with mean age who underwent IVF were included in a prospective controlled study in Academic Assisted Conception Unit. Anthropometric parameters were assessed (Table 1).

We developed a novel gas chromatography-mass spectrometry (GC-MS) method to determine BPA levels in serum, urine and follicular fluid (FF) and their impact on critical parameters of these women undergoing IVF. Metabolic, and hormonal parameters were also assessed (Table 2).

Results

We detected higher BPA levels in serum (0.780 ng/ml vs. 0.580 ng/ml, NS) and FF (1.128 ng/ml vs. 0.505 ng/ml, P<0.05) but lower BPA levels in urine (0.985 ng/ml vs. 1.500 ng/ml, P<0.05) of women with TF infertility compared to PCOS, with a trend towards higher follicular BPA levels in TF women and lower levels in PCOS women after BMI stratification (Table 3&figure1). After adjustment for age, BMI and exogenous FSH administration, follicular BPA levels correlated with decreased number of oocytes collected during ovocyte retrieval in TF women only (mean decrease of -1.772 oocytes, p<0.05) but no significant effect on the number of oocytes fertilized and pregnancy rates of both groups (Table 4).

Conclusions

The present study showed that BPA levels were higher in FF and correlated with decreased number of oocytes collected during ovocyte retrieval in women with TF infertility compared to PCOS.

References

- Wetherell et al. 2007
- Welshons et al 2006
- Knauf et al. 2011
- Wang et al. 2015