ABSTRACT

Following the banned and strict regulation on BPA use, bisphenol S or BPS has gained attention as an alternative to BPA. It was considered as a safer alternative to BPA due to the high thermal and light stability. However, rising evidence has shown that BPS exerts an endocrine-disrupting effect towards thyroid hormone system similar to BPA. Previous studies have suggested that the thyroid-disrupting effect of BPS during developmental period was associated with the neurodevelopmental toxicity. Unfortunately, conflicting results were found and there are still many uncertainties on how prenatal BPS exposure and thyroid hormone disruption linked with the neurodevelopmental effects of BPS. To further clarify this issue, systematic review on the neurodevelopment effects of BPS and BPA in the preclinical models were performed. A total of 41 articles, including 36 studies on BPA and 5 studies on both BPA and BPS, were obtained from PubMed, ScienceDirect, and SpringerLink and further qualitatively analysed. The results showed that BPS has similar manifestation of neurodevelopmental effect compared to BPA, including anxiety-like behaviour, poor learning and memory, and altered brain neuro-reproductive systems. However, BPS has been suggested to have a different mechanism compared to BPA. Further RT-PCR analysis of *THRα* expression on E16 and P1 mice brain following maternal exposure to the BPS was also performed in this study. The results showed that BPS did not affect the expression of THRα in mice brain both at E16 and P1. Combined with the previous findings, it suggests that BPS affect the *THRα* expression during early brain development possibly through different mechanism compared to BPA.

Keywords: bisphenol A, bisphenol S, neurodevelopmental toxicity, endocrine disruptors, thyroid hormone