



IF: 1.634

Asian Pacific Journal of Tropical Medicine

journal homepage: www.apjtm.org

doi: 10.4103/1995-7645.243113

©2018 by the Asian Pacific Journal of Tropical Medicine. All rights reserved.

Effects of Di-(2-ethylhexyl) phthalate on thyroid in pubertal female rats and related mechanism

Pu Shao^{1#}, Te Liu^{1#}, Meng Zhang¹, Na Li^{2✉}¹Scientific Research Center, China-Japan Union Hospital of Jilin University, Changchun, 130033, China²Hainan Institute of Tropical Medicine, Hainan Medical University, HaiKou 570000, China

ABSTRACT Objective: The quality of the tropical environment is directly related to the sustainable development of the economy, society and the health of people in the tropics. Di-(2-ethylhexyl) phthalate (DEHP) is a common plasticizer, and it is easier to precipitate in the tropics. Epidemiological studies revealed that DEHP are widely exposure in the population, and it displays the characters of endocrine disruptor. In this study, we investigated the association between DEHP exposure in pubertal female rats and the thyroid function, and elucidated the toxicity of DEHP on endocrine system. **Methods:** Female rats (21 days old) were randomly apportioned into four dose groups ($n=12$), and administered via oral gavage at 0, 250, 500, or 1000 mg/kg/d DEHP for up to 4 weeks. After anesthetized, blood was collected from the eyeballs and the serum was separated. And the concentration of serum thyroid stimulating hormone (TSH), total triiodothyronine (TT3), total thyroxine (TT4), free triiodothyronine (FT3), free thyroxine (FT4) and thyroid peroxidase (TPO) levels were measured by using ELISA. The thyroids of pubertal female rats were rapidly collected after decapitation, and the related gene and protein levels were analyzed by Real time RT-PCR and Western blot. **Results:** DEHP could be able to increase TSH, TT3, TT4, FT4 and TPO levels, but there were no changes in FT3. Meanwhile, the gene and protein expressions of TSH, thyroid transcription factor 1 (TTF1), paired box 8 (PAX8), and TPO in thyroid of pubertal female rats which treated with DEHP were significantly increased compared with the control group. **Conclusions:** These results were suggesting that DEHP may have thyroid toxicity on pubertal female rats. At the same time, it could also disturb thyroid function through affecting TSH, TTF1, PAX8, TPO. DEHP might affect the growth and development of puberty female rats through disrupting the endocrine regulation of the thyroid.

Keywords: i-(2-ethylhexyl) phthalate; Pubertal; Femae; Thyroid

Article history:

Received 10 September 2018

Received in revised form 16 September 2018

Accepted 25 September 2018

Available online 15 October 2018

These authors equally contributed to this work.

✉Corresponding author: Na Li, PhD, Hainan Institute of Tropical Medicine, Hainan Medical University, HaiKou 570000, China.
E-mail address: 28914358@qq.com

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-Share Alike 3.0 License, which allows others to remix, tweak and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

©2018 Asian Pacific Journal of Tropical Medicine Produced by Wolters Kluwer- Medknow

How to cite this article: Shao P, Liu T, Zhang M, Li N. Effects of Di-(2-ethylhexyl) phthalate on thyroid in pubertal female rats and related mechanism. Asian Pac J Trop Med 2018; 11(10 suppl):45.