

## Letter to the Editor

# Reply on “Constriction of the ductus arteriosus, severe right ventricular hypertension, and a right ventricular aneurysm in a fetus after maternal use of a topical treatment for striae gravidarum”

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We read with great interest the brief report of Dr Hayes concerning the unfortunate fetal constriction of the ductus arteriosus of a single male infant that the author associated with use of topically applied Bio-Oil<sup>®</sup>.<sup>1</sup> This is very surprising for us as Bio-Oil<sup>®</sup> has a long, safe history of use for the treatment of scars and striae and is widely used – it has been marketed in South Africa for 29 years and globally for 14 years, and last year alone over 19 million units were sold. In addition, all ingredients for cosmetic products are considered safe for their intended purpose and are reviewed by the Cosmetic Ingredient Review Expert Panel. Equally, there is no evidence for significant delivery of topical ingredients to the blood stream from cosmetic products, and as a result the systemic health risk is negligible.<sup>2</sup>

The author pointed out that polyphenols contained in certain foods, herbs, and teas may be implicated in fetal ductus arteriosus, and research has shown that their restriction from the diet is helpful.<sup>3–7</sup> Dr Hayes assumes that Bio-Oil<sup>®</sup> contains polyphenols, and concludes that Bio-Oil<sup>®</sup> is associated with the medical condition. In our opinion, however, Dr Hayes’ conclusion is based on the erroneous assumption that polyphenols are present in Bio-Oil<sup>®</sup>. Dr Hayes cites the literature that shows that polyphenols are present in general botanical extracts; however, polyphenols are water soluble, and as only essential oils of *Lavandula angustifolia* oil, *Rosmarinus officinalis* leaf oil, and *Anthemis nobilis* flower oil are used in Bio-Oil<sup>®</sup>, and the *Calendula officinalis* extract is produced by extraction in soybean oil, there are no polyphenols in the product.<sup>8–21</sup> It also bears mentioning that the essential oils and the *C. officinalis* extract in soybean oil included in the Bio-Oil<sup>®</sup> formulation together account for <0.2% of the product.

As Dr Hayes reports, the mother denied intake of excessive quantities of polyphenol-rich foods and beverages, but their total restriction from the diet was not controlled. If, as the author believes, this particular case is caused by polyphenols, then, in our opinion, it is still more likely to be a result of these substances in the diet, than from use of an anhydrous topical product such as Bio-Oil<sup>®</sup>.

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### Conflicts of Interest

A.V.R. and A.D. are both consultants to Union Swiss the manufacturer of Bio-Oil<sup>®</sup>. P.D. is an employee of Union Swiss.

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### References

- Hayes DA. Constriction of the ductus arteriosus, severe right ventricular hypertension, and a right ventricular aneurysm in a fetus after maternal use of a topical treatment for striae gravidarum. *Cardiol Young* 2016; 26: 796–798.
- Nohynek GJ, Meuling WJ, Vaes WH, et al. Repeated topical treatment, in contrast to single oral doses, with vitamin A-containing preparations does not affect plasma concentrations of retinol, retinyl esters or retinoic acids in female subjects of child-bearing age. *Toxicol Lett* 2006; 163: 65–76.

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3. Zielinsky P, Piccoli AL Jr, Manica JL, Nicoloso LH. New insights on fetal ductal constriction: role of maternal ingestion of polyphenol-rich foods. *Expert Rev Cardiovasc Ther* 2010; 8: 291–298.
4. Zielinsky P, Piccoli AL Jr, Manica JL, et al. Maternal consumption of polyphenol-rich foods in late pregnancy and fetal ductus arteriosus flow dynamics. *J Perinatol* 2010; 30: 17–21.
5. Zielinsky P, Piccoli AL Jr, Manica JL, et al. Reversal of fetal ductal constriction after maternal restriction of polyphenol-rich foods: an open clinical trial. *J Perinatol* 2012; 32: 574–579.
6. Zielinsky P, Piccoli AL Jr, Vian I, et al. Maternal restriction of polyphenols and fetal ductal dynamics in normal pregnancy: an open clinical trial. *Arq Bras Cardiol* 2013; 101: 217–225.
7. Hahn M, Baierle M, Charao MF, et al. Polyphenol-rich food general and on pregnancy effects: a review. *Drug Chem Toxicol* 2016; 1–7.
8. Verma RS, Rahman LU, Chanotiya CS, et al. Essential oil composition of *Lavandula angustifolia* Mill. cultivated in the mid hills of Uttarakhand, India. *J Serb Chem Soc* 2010; 75: 343–348.
9. Hamad KJ, Al-Shaheen SJA, Kaskoos RA, Ahamad J, Jameel M, Mir SR. Essential oil composition and antioxidant activity of *Lavandula angustifolia* from Iraq. *Int Res J Pharm* 2013; 4: 117–120.
10. Jianu C, Pop G, Gruia AT, Horhat FG. Chemical composition and antimicrobial activity of essential oils of Lavender (*Lavandula angustifolia*) and Lavandin (*Lavandula x intermedia*) grown in western Romania. *Int J Agric Biol* 2013; 15: 772–776.
11. Tomescu A, Rus C, Pop G, et al. Chemical composition of *Lavandula angustifolia* L. and *Rosmarinus officinalis* L. essential oils cultivated in west Romania. *Res J Agric Sci* 2015; 47: 246–253.
12. Genena AK, Hense H, Smania Junior A, Souza SM. Rosemary (*Rosmarinus officinalis*) – a study of the composition, antioxidant and antimicrobial activities of extracts obtained with supercritical carbon dioxide. *Cienc Tecnol Aliment Campinas* 2008; 28: 463–469.
13. Jamshidi R, Afzali Z, Afzali D. Chemical composition of hydro-distillation essential oil of Rosemary in different origins in Iran and comparison with other countries. *American-Eurasian J Agric Environ Sci* 2009; 5: 78–81.
14. Derwich E, Benziane Z, Chabir R. Aromatic and medicinal plants of Morocco: chemical composition of essential oils of *Rosmarinus officinalis* and *Juniperus phoenicea*. *Int J Appl Biol Pharm Technol* 2011; 2: 145–153.
15. Chahboun N, Esmail A, Rhaïem N, et al. Extraction and study of the essential oil *Rosmarinus officinalis* Cuellie in the region of Taza, Morocco. *Der Pharma Chemica* 2014; 6: 367–372.
16. Muley BP, Khadabadi SS, Banarase NB. Phytochemical constituents and pharmacological activities of *Calendula officinalis* Linn (Asteraceae): a review. *Trop J Pharm Res* 2009; 8: 455–465.
17. Wagner S, Pflieger A, Mandl M, Bochzelt H. Changes in the qualitative and quantitative composition of essential oils of clary sage and roman chamomile during steam distillation in pilot plant scale. In Zereszki S, (ed) *Distillation – Advances from Modelling to Applications*. InTech, Croatia, 2012: 141–158.
18. Butnariu M, Coradini CZ. Evaluation of biologically active compounds from *Calendula officinalis* flowers using spectrophotometry. *Chem Cent J* 2012; 6: 1–7.
19. Khalid KA, Teixeira da Silva JA. Biology of *Calendula officinalis* Linn: Focus on pharmacology, biological activities and agronomic practices. In: *Medicinal and Aromatic Plant Science and Biotechnology*. Global Science Books, 2011, 12–27. Available at [www.globalsciencebooks.info/Online/GSBOnline/images/.../MAPSB\\_6\(1\)12-27o.pdf](http://www.globalsciencebooks.info/Online/GSBOnline/images/.../MAPSB_6(1)12-27o.pdf)
20. Srivastava JK, Shankar E, Gupta S. Chamomile: a herbal medicine of the past with bright future. *Mol Med Rep* 2010; 3: 895–901.
21. Sharafzadeh S, Alizadeh O. Geraman and Roman chamomile. *J Appl Pharm Sci* 2011; 1: 1–5.