IODINE NUTRITION

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Iodine Content Is Low or Absent in Some U.S. Multivitamin and Prenatal Vitamin Brands

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Review of: Patel A, Lee SY, Stagnaro-Green A, Mackay D, Wong AW, Pearce EN 2018 Iodine content of the best-selling United States adult and prenatal multivitamin preparations. *Thyroid*. Epub 2018 Oct 30. PMID: 30266075.

SUMMARY

Background

Mild iodine deficiency (1) or estimated mild iodine deficiency (2) during pregnancy has been associated with impaired neurodevelopment in the offspring as measured by educational outcome, intelligence quotient, or other parameters. Accordingly, the 2017 Guidelines of the American Thyroid Association (ATA) for the diagnosis and management of thyroid disease during pregnancy and the postpartum (3) recommend that all pregnant women ingest approximately 250 µg of iodine daily and that in most regions, including the United States, women who are planning pregnancy or are pregnant should supplement their diet with a daily oral supplement of 150 µg in the form of potassium iodide (KI). Similar recommendations have been made in guidelines by other organizations. In the study reviewed here, Patel et al. (4) assessed the iodine content of the best-selling adult multivitamins (AMVs) and prenatal vitamins (PMVs) in the United States.

Methods

Data was obtained from Information Resources, Inc. (Chicago, IL), a market and sales research company that tracks purchase, media, social, causal, and loyalty data. Sales information of nearly 100 U.S. AMV and 60 PMV companies (from general retail

stores, but not of direct sale or Internet purchases) were analyzed for the period from July 2016 to July 2017. The iodine content of included AMV and PMV brands was obtained from their product labels.

Results

There were 89 AMV and 66 PMV products included in this study. Total annual sales of the included AMVs was nearly \$1 billion; the annual sales of PMVs was about 15% of this amount. However, the daily doses of PMVs sold was only about 5% of the amount for AMVs.

Nearly 75% of the AMV brands contained iodine, 75.8% of which contained 150 µg of iodine per daily dose (PDD). Some AMV brands contained as little as 38 µg PDD, but none exceeded 150 µg PDD. The source of iodine in all AMV brands was KI.

Almost 58% of the PMV brands contained iodine, 91.2% of which contained 150 µg of iodine PDD. The iodine content of the PMV brands ranged from 25 to 290 µg per day, and nearly three quarters of the iodine-containing PMVs were sourced from KI. A minority of the brands contained kelp as their source of iodine, and one used inactivated *Saccharomyces cerevisiae*.

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Conclusions

Although the majority of the best-selling U.S. brands of AMVs contain iodine, a relatively large proportion (about 25%) do not. It is notable that an even greater percentage of the best-selling brands of U.S. PMVs (almost 40%) do not contain iodine. Most iodine-con-

taining brands of AMVs and PMVs in the United States contain the recommended amount (150 µg of iodine PDD), but the iodine content in some are as low as 25 µg and exceeded this threshold by as much as 93% in others.

COMMENTARY

The study reviewed here (4) indicates that among the best-selling brands of U.S. AMVs and PMVs, most are supplemented with iodine, but the percentage of brands that do not contain iodine is not inconsequential. For some brands, the iodine content is well below the recommended amount, while others exceed this threshold. It should be noted, however, that the highest amount of iodine content among the included brands (290 µg) is well below the criteria for excessive iodine that is more typically associated with the most adverse outcomes, such as fetal or neonatal goiter or exacerbation of toxic nodular goiter. Furthermore, the sources of iodine even in the best-selling brands are not always as recommended by the ATA (3) and other organizations. KI is recommended as the source of iodine, probably because it can be added as a specified weight to provide the recommended iodine content.

Arguably, the most serious consequence of iodine deficiency is its adverse neurodevelopmental effects during the fetal and postnatal periods. This is the problem that the guidelines relating to iodine supplementation during pregnancy (3) seek to address. It is ironic, therefore, that the percentage of iodine in the iodine-containing brands, the range of iodine content in the various brands, and the sources of iodine among the best-selling PMVs were all inferior to those among the best-selling AMVs. One of the most important future contributions of the study by Patel et al. may be to promote better and more

uniform formulations of PMVs in the United States and elsewhere. Furthermore, PMV brands were not only less than optimal in these formulations, but also considerably more expensive (based on comparisons of the net sales with the net consumption data). Without information regarding the production, distribution, and other associated costs of these brands, it is not clear whether these differences relate to a less competitive market.

The study reviewed here is to be commended for the large number of brands it included. It is unfortunate that it was necessary to exclude 10 private-label brands because their iodine content could not be determined. The study also did not include brands from direct-sale stores, specialty stores, and Internet sales. It should also be noted that the reliability of the study is dependent on the reliability of the products' labels; this information was not reported.

Given the distribution and fluidity of dietary sources of iodine in the United States, it seems unlikely that there is a need for iodine supplementation in specific populations regionally, but that it may be necessary in persons with unusual dietary practices even if they are not women of childbearing age. Therefore, when considering the significance of the study by Patel et al. and how it should direct clinical practice, it is clear that this depends mostly on the validity of current guidelines for iodine supplementation during pregnancy and the postnatal nursing

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period (3). Among the challenges in this field the questions of what is the range of iodine intake that would ensure optimal fetal and postnatal developmental outcomes, and how do we overcome the lack of a reliable and clinically accepted test to rule out iodine deficiency in individual patients as opposed to populations?

Despite these difficulties, the 2017 ATA guidelines (3) are convincing in that the guidelines' authors have carefully considered the large volume of literature relating to iodine intake, thyroid status, and fetal

development and that the recommendations are reasonable as far as achieving iodine sufficiency without risking iodine excess. Just as the study reviewed here should promote changes in the standards for the iodine content in U.S. PMVs, it should also guide those who are caring for women who are contemplating pregnancy or who are pregnant in making recommendations for optimal fetal outcomes. Based on the study by Patel et al., it is necessary to counsel patients that not all of even the best-selling brands of PMV and/or AMV contain iodine, let alone the recommended amounts of iodine.

References

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