

Neonates of hypothyroid mothers have a below-normal head circumference

To the Editor:

Neonates of hypothyroid mothers are prone to develop neurologic abnormalities. We studied whether this finding is due to the underdevelopment of the brain size as measure by head circumference [1,2]. The number of reports on the head circumference of neonates of hypothyroid mothers is scarce and conflicting. We compared 139 neonates (82 males, 57 females) of hypothyroid mothers aged  $31 \pm 4.4$  years to a larger number of controls from a total of 18,538 deliveries at the Rabin Medical Center, Petah Tikva, Israel, between 1987 and 1993. Data on mothers and neonates were obtained from computerized medical records. The head circumference (i.e., brain size), body length, and weight of the neonates were measured by trained nurses at the neonatal department. Analysis of the data was conducted using analysis of variance (Anova).

The study was approved by the hospital ethics committee. The head circumferences of our control groups corresponded to those of the Canadian study by Barbier and colleagues [1].

The mean head circumference of the female neonates of hypothyroid mothers was significantly smaller than that of the male neonates ( $33.8 \pm 1.4$  cm,  $P = 0.047$ ). Of the 139 newborns of hypothyroid mothers, we found data on head circumference related to gestational week for only 119. These results are shown in Table 1.

We found that in male newborns of hypothyroid mothers at gestational weeks 37 to 41, the head circumferences were significantly smaller than those of the newborns of healthy controls. For the female neonates, this finding is true only for the 38th week of gestation.

Our results indicate that, whereas birth length and weight of the offspring of hypothyroid mothers are normal for gestational age, the head circumference in female neonates is slightly smaller than that of the males. In addition, neonates of both sexes have a tendency for a smaller (head circumference) than that of the neonates of healthy mothers. Whether the smaller-than-normal circumference (i.e., brain size) at birth of newborns from hypothyroid mothers is an indicator of inadequacy of thyroid hormone replacement during pregnancy needs further study.

References

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The possibility of transmitting infections with vaginal ultrasound probes: why the guidelines must be met

To the Editor:

In 2017, the Israeli Ministry of Health (MOH) issued guidelines for cleaning and disinfection of vaginal ultrasound (VUS) probes. These guidelines required high-level disinfection following each use based on the classification of VUS probes as semi-critical medical devices. In a review published in the January 2019 issue of the *Israeli Medical Association Journal (IMAJ)*, Ben David and colleagues [1] claimed that they were unable to meet the guidelines. We take exception to this statement, for several reasons.

The authors cited a paucity of reports in the literature describing infections related to the use of VUS probes to support their claim that the MOH guidelines are unjustifiably strict.

Yet, this argument has at least two significant shortcomings: first, as the authors themselves stated, inadequately disinfected VUS probes may transmit viruses such as hepatitis A, hepatitis B, hepatitis C, human immunodeficiency virus (HIV), and human papillomavirus (HPV), pathogens that may not be detected for years. Given this fact, what is the likelihood that a clinical manifestation or incidental discovery of

Table 1. Data on head circumference of hypothyroid mothers compared to healthy controls

	Gestational age, weeks	Hypothyroid mothers*		Healthy mothers**		P values <sup>§</sup>
		Head circumference, cm	n	Head circumference, cm	n	
Male neonates	37	34.3 ± 1.6		34.1 ± 1.3	1238	0.44
	38	34.4 ± 1.3	13	34.6 ± 1.3	2938	0.65
	39	34.2 ± 1.0	15	34.9 ± 1.2	4252	<b>0.022</b>
	40	34.6 ± 1.0	18	35.2 ± 1.2	3894	<b>0.036</b>
	41	34.9 ± 1.2	14	35.6 ± 1.2	1839	<b>0.039</b>
Female neonates	37	33.5 ± 1.7	4	33.6 ± 1.3	1213	0.88
	38	33.2 ± 0.9	8	34.0 ± 1.2	2980	<b>0.045</b>
	39	33.8 ± 1.1	16	34.3 ± 1.2	4260	0.07
	40	34.7 ± 1.2	15	34.6 ± 1.2	3796	0.65
	41	34.5 ± 1.6	7	34.9 ± 1.1	1780	0.39

<sup>§</sup>Bold indicates statistical significance

\*Based on data from the neonatology department, Rabin Medical Center (Beilinson Campus), Petah Tikva, Israel

\*\*Data from the Canadian Neonatal Network new reference curves for head circumference at birth, by gestational age [1]

one of these viruses years after acquisition will be definitively traced back to the contaminated VUS probe that was the source of infection? A scarcity of published reports describing infections related to use of VUS should not be construed to mean that such infections do not occur [2].

Second, microbes transmitted in healthcare settings may have epidemiological significance even if they do not have clinical manifestations in the patient acquiring them. For example, a multidrug-resistant bacterial pathogen that a woman acquires in the ultrasound suite may not result in infection to her, but she may in turn become the source of transmission of that pathogen to other patients, some of whom may become ill.

The literature review provided by Ben David and co-authors [1] actually provides justification for the guidelines' insistence on adequate cleaning and high-level disinfection of VUS probes. The references that were summarized, including a meta-analysis demonstrating a pooled prevalence of pathogenic bacteria on endovaginal probes after low-level disinfection of 12.9% [2], clearly demonstrated the persistence of bacterial and viral pathogens on VUS probes, even with the use of probe covers and low-level disinfection and even when the probe covers remained intact during the examination. In fact, an abundance of literature supports the inadequacy of probe covers in the absence of high-level disinfection to prevent contamination of VUS probes [2-7].

Based on these data, we are curious as to the authors' recommendations for patients who are known carriers of hepatitis B or C viruses, or HIV. Would they support the use of high-level disinfection after probe use in such cases? Standard precautions, which are required in all medical encounters, allow for the carriage of these blood-borne viruses, as often both the carrier and healthcare provider are unaware that asymptomatic carriage in fact exists. If the authors truly think that less than full adherence to the current guidelines can constitute safe practice for the general patient population, they would have to

advocate the same standards for carriers of hepatitis B or C viruses, and HIV.

More data could, of course, be generated. But, given the data that currently exist regarding the persistence of infectious pathogens on probes following low-level disinfection, would an ethics review board approve a clinical trial comparing high-level to low-level disinfection for VUS probes? If the board did approve such a study, would women consent to participate in such a trial if the existing data were presented to them in advance of enrollment?

The authors attempted to support their claim that the guidelines are unnecessarily strict by stating that, "No similar guidelines for hand disinfection before and after digital vaginal examination have been issued." This is incorrect. The guidelines for hand hygiene in healthcare facilities issued by the MOH in 2009 clearly state that hand disinfection must be performed before and after glove use.

While the abstract claims that, "many obstetrics and gynecology ultrasound units in Israel find it difficult to adhere to these strict disinfecting requirements," the article itself provides no evidence to back this claim. The authors rightly state that the prescribed cleaning and disinfection process can take several minutes, and that this time should be considered when scheduling patients. But beyond their own unexplained difficulty in adherence to the guidelines, nowhere do they back their claim that this difficulty is widespread.

Finally, we would remind the authors that these are mandatory guidelines. Unlike the U.S. Centers for Disease Control and Prevention guidelines [8], and those of the American Institute of Ultrasound in Medicine [9], on which the MOH guidelines are based, the Israeli guidelines are not a recommended but rather a compulsory, evidence-based safety standard that must be met wherever VUS is performed.

While it is one thing to take scientific issue with existing guidelines, the title of the review by Ben David et al. [1] states that they cannot meet these guidelines. We find it troubling that a flagship journal of a national medical society would lend cre-

dence to such a stance, and we trust that the medical institution at which the authors practice effectively oversees implementation of the guidelines at all clinical sites where VUS is performed.

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