A biparietal / transverse abdominal diameter (BPD/TAD) ratio ≤1: a potential hint for open spina bifida at 11–13 weeks scan

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Objective
In the first trimester of pregnancy, a biparietal diameter (BPD) below the 5th percentile is a simple marker that makes it possible to detect half of all cases of open spina bifida. We hypothesized that relating the BPD measurement to the transverse abdominal diameter (TAD) might be another simple and effective method. We assessed the performance of the BPD/TAD ratio during the first trimester of pregnancy in screening for open spina bifida.

Methods
A total of 20,551 first-trimester ultrasound scans (11–13 weeks of gestation) from 2000 to 2013 were analyzed retrospectively; they included 26 cases of open spina bifida and 17,665 unaffected pregnancies.

Results
The mean BPD/TAD ratio was 1.00 (SD ±0.06) for the spina bifida cases and 1.13 (±0.06) for the control cases (P<0.0001). BPD ≤ 5th percentile enabled the detection of 46.2% of the spina bifida cases, while a BPD/TAD ≤ 1 detected 69.2%, and the combination of one or the other identified 76.9%. In the latter case the false-positive fraction was 5.1%, while that for the combination of both (BPD ≤ 5th percentile and BPD/TAD ≤ 1) was 0.6% (sensitivity was then 38.5%). The positive prediction value of the combination of BPD ≤ 5th percentile and BPD/TAD ≤ 1 for spina bifida was 8.5%.

Conclusion
Between 11 and 13 weeks, relating the BPD to the TAD measurement considerably improves the diagnostic performance of a simple BPD in screening for open spina bifida. Screening for this marker is simple and applicable to a large population.