

The value of fetal ultrasonography and magnetic resonance imaging in the assessment of diaphragmatic hernias

The article "The value of fetal ultrasonography and magnetic resonance imaging in the assessment of diaphragmatic hernias"⁽¹⁾ describes the intrauterine diagnosis of diaphragmatic hernias by fetal magnetic resonance imaging (MRI) and ultrasonography (US). Like the authors of the mentioned article, I am enthusiastic about the utilization of MRI in the prenatal diagnosis of congenital abnormalities. However, this enthusiasm frequently may lead to equivocal conclusions.

Despite the small-sized sample (only 14 cases), the article describes a significant casuistic, especially considering the low frequency of this congenital abnormality, the high complexity and high cost of the diagnostic method, besides its poor utilization for this purpose⁽²⁾. However, it is important to highlight that the study included a series of cases involving a quite small number of patients, reaching strong conclusions. Notwithstanding the highest frequency of detection of the liver within the thoracic cavity by MRI as compared with US, one cannot conclude that a method is better than the other, considering that MRI correctly diagnosed the thoracic position of the fetal liver in eight cases whereas US did it in five cases of a 14-patient sample. The statistical analysis by the chi-squared test has not demonstrated any significant difference ($p = 0.26$). So, the findings of this study are probably not enough to support this conclusion. These results only can suggest that MRI presents a higher frequency than US in the diagnosis of thoracic position of the fetal liver and that further studies are necessary to confirm this hypothesis.

Other studies have demonstrated that the presence of the liver within the thoracic cavity corresponds to a poor prognosis in cases of congenital diaphragmatic hernias (CDH)⁽³⁾. Then, the authors, by deduction, discuss the relevance of MRI in the evaluation of the fetal prognosis based on the better performance of MRI in the diagnosis of the hepatic position. However, the relevance of MRI for definition of the fetal prognosis in cases of CDH only could be confirmed by a comparative study with two

groups of patients with CDH, one evaluated by MRI and other by US, with respective perinatal outcomes. Likewise, a comparative study involving two groups would be necessary to approach the suspicion of pulmonary hypoplasia in CDH, which at US can be evaluated by the lung/cephalic circumference ratio and, at MRI, by the signal intensity of the pulmonary parenchyma.

Finally, another fact to be highlighted is that 11 out of the 14 patients with CDH had a cesarean delivery. This topic should be further discussed to avoid that the presence of CDH is interpreted as an indication for cesarean section. The study suggests that outcomes are slightly better in fetuses born by cesarean section, although no statistically significant difference is reported. However, the authors themselves emphasize that it cannot be concluded whether the elective cesarean section was the cause for a better outcome or whether institutions where elective cesarean sections are favored are more able to manage patients with CDH⁽⁴⁾.

The present comments do not invalidate the significance of the study; they represent a contribution for a reflection about the utilization of MRI as a routine for this purpose whereas it should be reserved for research protocols in the intrauterine diagnosis of congenital abnormalities. Congratulations to the authors for the initiative to study this topical issue that raise many questions that still remain to be answered.

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Replay

Firstly, we would like to thank Dr. Alex Sandro Rolland de Souza for his interest in our article, as well as for his interesting comments. However, we do not agree that the enthusiasm has led us to draw equivocal or excessively strong conclusions. The conclusion of the mentioned study is transcribed herein: "Finally, US and MRI constitute complementary methods in the evaluation of patients with CDH. MRI plays a significant role as a supplement to US in the diagnosis and prognostic evaluation of CDH, and can easily assess the liver position. Additionally, MRI does not present the typical US limitations represented by the presence of artifacts resulting from poor fetal positioning, beam attenuation in maternal adiposity and operator dependence"⁽¹⁾. We reiterate the current role of MRI as a supplement to US in the evaluation of congenital diaphragmatic hernia; but the present study, as well as others, has shown quite promising results⁽²⁻⁴⁾.

The statistical analysis performed by the reader based on the results from the present study comparing the number of liver-up cases diagnosed by MRI and US has also been performed by us, but considering statistical fundamentals, especially because of the low number of cases, such analysis does not allow us to conclude which method would be statistically better. However, MRI demonstrated 100% of liver-up cases, while US demonstrated 62.5%. These results allow us at least to suggest that further studies are developed specifically to compare US and MR in the evaluation of this abnormality. As regards the role of MRI in the prognostic evaluation of patients with CDH, we agree that a comparative study evaluating both methods (US and MRI) in relation to the prognosis of the fetuses is required to confirm the relevance of MRI in these cases. However, based on the results from this casuistic and on our experience with imaging in fetal medicine, we have concluded that MRI allows a good identification of the herniated liver (a significant prognostic factor), and hence it is our understanding

that certainly the prognostic relevance of MRI will be confirmed by future studies, as emphasized in your article. As regards the final topic raised by the reader, about the eventual relationship between the presence of CDH and cesarean section surgery, in agreement with our article, we emphasize that our casuistic does not allow the correlation between the type of delivery and the presence of CDH.

Finally, we emphasize that the objective of the study was not to present MRI as a replacement for US. It is our understanding that MRI can provide additional images not only for diaphragmatic hernias but also for other pathologies (of the central nervous system, for example), aiding not only in the diagnosis but also in the evaluation of the fetal prognosis. This study presents a small sample of an uncommon pathology, indicating the cases where MRI could be utilized in the follow-up of fetuses with dia-

phragmatic hernia. Ultrasonography remains as a method of choice for screening and diagnosing CDH, because of its low cost and higher equipment availability. However, in some situations, such as in cases of maternal obesity, oligohydramnios and inappropriate fetal position, echographic images are poorly conclusive. Our suggestion is that MRI is utilized as an additional step in cases of a difficult echographic evaluation. This method is useful not only for evaluating the hernial content, identifying the liver-up (a sign implying worsening in the fetal prognosis) on T1-weighted sequences, but also for evaluating the pulmonary volumetry, in cases where this is not possible by 3D ultrasonography. Therefore, as previously highlighted in our conclusion, MRI does have a great relevance, not as a routine method, but as a supplement to US in the diagnosis and prognostic evaluation of diaphragmatic hernias.

Again, we would like to thank you for your comments.

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