**Table 1.** Ultrasonographic characteristic that were examined.

| | Foetal thyroid status (FTS) | Foetal heart rate (FHR) | Foetal bone maturation (FBM) | Foetal movement | Foetal growth | Vascularization (colour doppler) | Foetal development | Amniotic fluid volumes |
|---|---|---|---|---|---|---|---|---|
| **Cohen (2003)** | X | | | | | | | |
| **Luton (2005)** | X | X | X | | X | X | | |
| **Polak (2004)** | X | X | X | | X | | | |
| **Huel (2008)** | X | X | X | X | | X | | |
| **Grigoriu (2008)** | X | | X | | X | | | |
| **Delay (2019)** | X | | | | | X | | X |
| **Hawken (2016)** | X | | | | | | | |
| **Ashkar (2022)** | X | X | X | | X | | | |
| **Munoz (2019)** | X | | | | X | | X | X |
| **Illouz (2018)** | X | X | X | X | X | X | | |
| **Chan (2007)** | X | X | X | | X | X | | |
| **Panaitescu (2018)** | X | X | X | | X | | | |

**Table 2.** Detailed overview data-extraction for expert opinion

| | Study design | Patients and setting | Intervention | Outcome measures | Study result |
|---|---|---|---|---|---|
| **Cohen (2003)** | Controlled trial | 20 pregnant women with gestational Graves' disease were examined in the foetal thyroid unit of the Sheba Medical Centre in Tel-Aviv Israel. | They performed serial ultrasounds between 14-17 weeks (transvaginal) and between 18-37 weeks (abdominal) gestation. This was done by an obstetric sonographer who was blinded to the treatment. | - Foetal thyroid status (FTS) | Foetal ultrasonography of the foetal thyroid is an important diagnostic tool to monitor drug dosage. |
| **Luton (2005)** | Prospective study | 72 pregnant women with a history of GD who attended the Robert Debre Teaching Hospital in Paris, France between 1999 and 2002. | Serial ultrasounds were performed once a month starting at 22 weeks gestation. The ultrasounds were performed by the same person. | - FHR<br>- FTS<br>- Foetal growth<br>- FBM<br>- Colour doppler | In pregnant women with past or current GD, ultrasonography of the thyroid gland is an excellent diagnostic tool. |
| **Polak (2004)** | Prospective study | This study included 72 pregnant women with a history of GD who attended the Robert Debre institution between 1999 and 2002. | Foetal ultrasounds were performed at 22 and 32 weeks by an expert ultrasonographist. | - FHR<br>- FTS<br>- Foetal growth<br>- FBM<br>- When a foetal goitre was found, a colour doppler was performed. | Serial ultrasounds should be performed monthly starting at 22 weeks to avoid exposing the foetus to the harmful effects of the untreated GD. |

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| **Huel (2008)** | Retrospective case study | 39 cases of a foetal goitre in pregnant women with mainly GD. Who attended the Robert Debre Hospital in Paris, France during pregnancy were retrospectively studied. | Serial ultrasounds were performed once a month starting at 22 weeks' gestation. | - Colour Doppler: vascularization<br>- FTS<br>- Foetal heart rate (FHR)<br>- Foetal bone maturation (FBM)<br>- Foetal movements<br>- Foetal growth | Based on the colour doppler outcome of the goitre, foetal heart rate, bone maturation and foetal mobility we can predict the foetal thyroid function. |
| **Grigoriu (2008)** | Retrospective study | 38 pregnant women with hyperthyroidism who attended the Obstetric unit of the University Emergency Bucharest Hospital during pregnancy in the past 5 years were retrospectively studied. In 34 of the 38 patients the cause of hyperthyroidism was GD. Others were hyperemesis gravidarum and gestational transient hyperthyroidism. | Foetal serial ultrasounds were performed before week 28 and 32 of gestation. | - FTS<br>- FBM<br>- FHR<br>- Foetal growth | Foetal serial ultrasounds should be performed at 28- and 32-weeks gestation if there is evidence of maternal GD. To monitor the foetal thyroid function. |
| **Delay (2019)** | Multicentre retrospective study | 17 pregnant women with a foetus that was found with an ultrasound confirmed goitre that attended a prenatal diagnosis centre of the Pays de Loire perinatal network were included. Between the start of 2010 to the end of 2015. | Every 2 weeks, since ultrasound confirmed a foetal goitre, an ultrasound was performed to monitor the goitre.<br><br>Guidelines foetal thyroid circumference: axial slice, performed above the cricoid cartilage, identification of the thyroid, oval tissue image surrounding the trachea, situated in front of the vertebra and framed by the two carotid arteries. | - FTS<br>- Amniotic fluid volume<br>- Colour doppler | Ultrasounds and a multidisciplinary approach remain the best way to avoid or/and diagnose a foetal goitre. And can help to determine whether the foetal goitre is causing hypo- or hyperthyroidism. |

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| **Hawken (2016)** | Multicentre retrospective observational study | Pregnant women with GD who attended hospitals in the Poitou-Charentes region during pregnancy. Between January 2005 and December 2012 were retrospectively studied.<br><br>Patients were excluded when hyperthyroidism was linked to another disease than GD, and if they were followed outside the Poitou-Charentes region.<br><br>The study included 95 pregnancies in 82 patients. | Specialized obstetric ultrasound investigations to examine the foetal thyroid were performed by an experienced foetal ultrasonographer. When the patients were treated with SAT and/or had TRAb level >3 N during the second (the 20th week) or third trimester. | - Foetal thyroid ultrasound (FTU) | Targeted use of specialized foetal ultrasonography in the second and third trimester is helpful to determine foetal dysthyroidism. |
| **Ashkar (2022)** | Review | Pregnant women with a history of GD, with elevated TSH receptor antibodies (TRAb) in the second half of pregnancy. | - | - FHR<br>- FTS<br>- Foetal growth<br>- FBM | Additional foetal ultrasonography should be performed in women with uncontrolled hyperthyroidism in the second half of pregnancy and with elevated TRAb levels. This should be performed monthly starting after the 18th-22nd week. |

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| **Munoz (2019)** | Review | Pregnant women with signs of uncontrolled hyperthyroidism and TRAb levels three times the normal value. | - | - Foetal goitre volume<br>- Foetal growth assessment<br>- Foetal brain/heart/skeletal development<br>- Amniotic fluid volumes | Foetal goitres are best diagnosed by ultrasonography in the second or third trimester in women with uncontrolled hyperthyroidism and elevated TRAb levels. |
| **Illouz (2018)** | Review | Pregnant women with a history GD who have present TRAb or who are under ATDs. | - | - FTS<br>- Foetal growth<br>- FHR<br>- Active movement<br>- FBM<br>- Colour doppler | When TRAb are present or the mother is under ATDs, a monthly ultrasound scan starting from 20 weeks is advised for close monitoring. If TRAb are absent up to the 3rd trimester, no ATD are needed and no specific foetal monitoring is required.<br><br>Ultrasound measurement of the foetal thyroid identifies the foetal risk of a thyroid disorder and can help distinguish between hyper- and hypothyroidism. A foetal goitre is defined by dimensions beyond the 95th percentile according to gestational age. |
| **Chan (2007)** | Review | Chan et al. searched PubMed for relevant articles between 1965 and 2006. That mentioned pregnant women with a history of GD or hyperthyroidism. | - | -FTS<br>- Foetal growth<br>- FHR<br>- FBM<br>- Colour doppler | Foetal ultrasound to monitor thyroid function has a sensitivity of 92% and a specificity of 100%. And can help make a differentiation between fetal hyper- and hypothyroidism.<br><br>To assess the FTS, serial ultrasounds should be performed at 28 and 32 weeks, if there is evidence of |

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| | | | | | active GD (elevated TRAb levels OR maternal ATD treatment). |
| **Panaitescu (2018)** | Editorial | Pregnant women with a history of GD that have TRAb levels that are three times the norm. | - | - Examination of the foetal neck (FTS)<br>- FBM<br>- FHR<br>- Foetal growth | When TRAb levels are above three times the norm in pregnant women with GD close follow-up should be initiated. This includes an ultrasound scan every four weeks starting from the second trimester.<br><br>Foetal ultrasounds make for easy recognition of a foetal goitre; it however is not reliable in distinguishing between a hypo- or hyperthyroid goitre. |