Effectiveness of Locally Developed Placental Histology Guidelines on Detecting Placental Pathology

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Introduction

An emerging area of research is the role of placental histology in providing information on the management of the current infant or subseqeuent pregnancies. In most pregnancies, the newborn and placenta are normal so only a subset of placentas require histological examination. We have developed a local guideline (Appendix 1) that provides guidance on when a histological examination of placenta is required to detect clinically relevant placental pathology.

The aim of this study was to audit our locally developed guideline for placental histology indications in its ability to detect clinically significant placental pathology.

Methods

This was a retrospective chart review of all placentas sent for histological analysis from 01/01/2019 to 31/12/2020 at Ipswich Hospital. Based on the local guideline, placentas were grouped into appropriately sent (N=263) and inappropriately sent (N=191). Histology result were reviewed to determine if clinically relevant histology was present including maternal vascular malformation, fetal vascular malformation, infection or villitis of unknown aetiology based on the Amsterdam Consensus Criteria for Placental Lesions.

Research Ethics Committee deemed this study an audit of practice and exempt from full ethical review.

Results

Of total number placentas sent for histological analysis (N=464), 56% (N=263) were sent appropriately based on the guideline. 41% (N=191) of the placentas were sent inappropriately.

Maternal vascular malperfusion was significantly more likely to be detected in the appropriately sent group (6.1% vs 2.1%, P=0.04) as was other non-specific pathology (20.9% vs 12.0%, P=0.01).

The inappropriately sent group had a significantly increased rate of normal histology (27.7% vs 40.3%, P=<0.01).

The composite detection of clinically relevant pathology was similar between groups (51.3% vs 47.6%, P=0.44).

	Appropriately sent (N=263)	Inappropriately sent (N=191)	Chi-square P-value
Maternal vascular malperfusion (MVM)	16 (6.1%)	4 (2.1%)	0.04
Fetal vascular malperfusion (FVM)	30 (11.4%)	22 (11.5%)	0.97
Infection	69 (26.2%)	51 (26.7%)	0.91
Villitis of unknown eitology (VUE)	20 (7.6%)	14 (7.3%)	0.9
Other	55 (20.9%)	23 (12.0%)	0.01
Normal	73 (27.7%)	77 (40.3%)	<0.01
Composite clinically relevant pathology (MVM, FVM, Infection, VUE)	123 (51.3%)	91 (47.6%)	0.44

Discussion

The results of this audit showed poor compliance with the recently implemented local guideline on indications for histological examination of placenta during the study period.

Our results suggest that the guideline improved detection of maternal vascular malperfusion and was less likely to result in normal placenta's being sent for histology. There was no difference in detection of fetal vascular malperfusion, infection or villitis of unknown etiology.

The guideline was more likely to detect other non-specific pathology such as placental size >10% or <10%, 2 vessel cord or small area infarction.

We conclude that our local guideline is able to detect some but not all clinically significant placental pathology and further investigation is needed to determine which areas can be changed to improve detection rates. Further investigation is also required to reduce the requests for histological examination of placentas with normal or non-clinically significant pathology.

Appendix 1

West Moreton Health

Indication for Histological Placental Examination:

Maternal Conditions:

- Preeclampsia prior to 34 weeks
- Intrapartum fever (above 38 degrees)
- Chorioamnionitis
- Recurrent antepartum aemorrhage
- Placental abruption
- Type 1, Type 2 Diabetes
- Rhesus isoimmunisation
- Morbidly adherent placenta
- Maternal GBS (if known)

Fetal conditions

- Confirmed antenatal fetal growth restriction (<10th centile)
- Preterm birth <34 weeks
- Mid trimester loss
- Post term > 42 weeks
- Multiple pregnancy
- Stillbirth or fetal death

Neonatal conditions:

- Poor condition at birth requiring admission to SCN (cord pH < 7, Apgar score ≤6 @ 5 mins, IPPV > 10 mins)
- Rhesus isoimmunisation or Hydrops fetalis
- Birthweight (≤10th centile)
- Severe anaemia

Placental indications:

- Placenta or cord abnormality in USS
- Presence of physical abnormality on gross examination:
  - Small or large placental size
  - Two vessel cord
  - Umbilical cord lesions (e.g. thrombosis, torsion)
  - Abnormalities of cord length long/short or hyper coiled

References:

1. *Boergen RN Indications for submission and mascroscopic examination of the placenta. Journal of pathology microbiology and immunology 2018; 126:544 -50*
2. *Cox P and Evans C. Tissue pathway for histopathological examination of the placenta. The Royal College of Pathologists 2017; G108 version 2*

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