

IGFBP-1 test for PPROM in a tertiary unit: QI and cost effectiveness

Dr Milena Petrovic, Dr Eirini Vaikousi, Dr Rita Sarquis, Dr Vidya Ravikumar, Helen Dent, Susie Douglas
Professor Dimitrios Siassakos, Mr George Attilakos

BACKGROUND:

Preterm prelabour rupture of membranes (PPROM) complicates up to 3% of pregnancies and is associated with 30–40% of preterm births¹. PPROM can result in significant neonatal morbidity and mortality, primarily from prematurity, sepsis, cord prolapse and pulmonary hypoplasia. In addition, there are risks associated with chorioamnionitis and placental abruption². The median latency after PPROM is 7 days and tends to shorten as the gestational age at PPROM advances^{3,4}.

OBJECTIVE:

To identify inconclusive/ missed cases of preterm pre-labour rupture of membranes (PPROM) presenting in tertiary hospital and cost effectiveness of using the IGFBP-1 test

DESIGN:

Retrospective study of all cases presenting with PPROM (less than 37 weeks), identifying missed/inconclusive cases, risk assessment and cost effectiveness of the IGFBP-1 test.

METHODS:

All PPROM presenting in MFAU/triage between April 2019 and May 2020 were collected from electronic records, and analysed for:

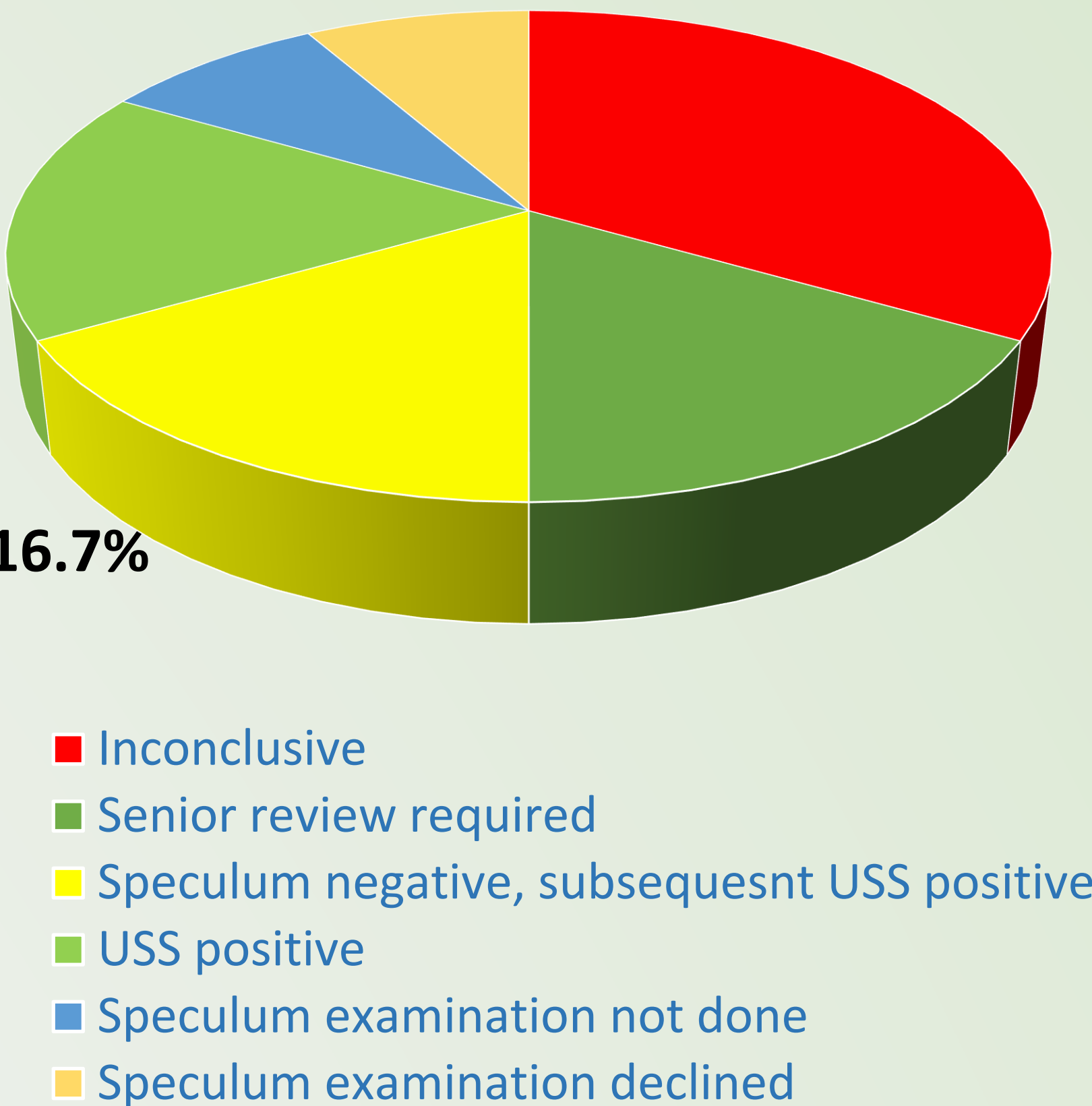
- 1.Percentage of patients presenting with PPROM to MFAU
- 2.Diagnostic challenges: percentage of patients with uncertain result - inconclusive and/or false negative results
- 3.Duration of admission
- 4.Any missed cases which led to serious incidents (SI)
- 5.Compliance with current Trust guideline and RCOG/NICE guidelines

Management cost of cases with diagnostic challenges was calculated, and compared with cost of implementation of IGFBP-1 test to assess cost effectiveness.

RESULTS:

Total 99 cases identified, 12 uncertain (12.1%)
Of uncertain PPROM cases :

- **Inconclusive: 33.3%**
- **Senior review required: 16.7%**
- **Speculum negative, subsequent USS positive: 16.7%**
- **USS positive: 16.7%**
- **Speculum examination not done: 8.3%**
- **Declined speculum examination: 8.3%**



Average hospital admission length due to PPROM: 3 days

Average total hospital admission length was 6 days, median 5 days

More than 3 days admission was either because of chorioamnionitis or delivery or being extremely preterm

Hospital cost: £527 per day⁵

Additional USS: £159⁵ per examination

Diagnostic test cost: £14 per test

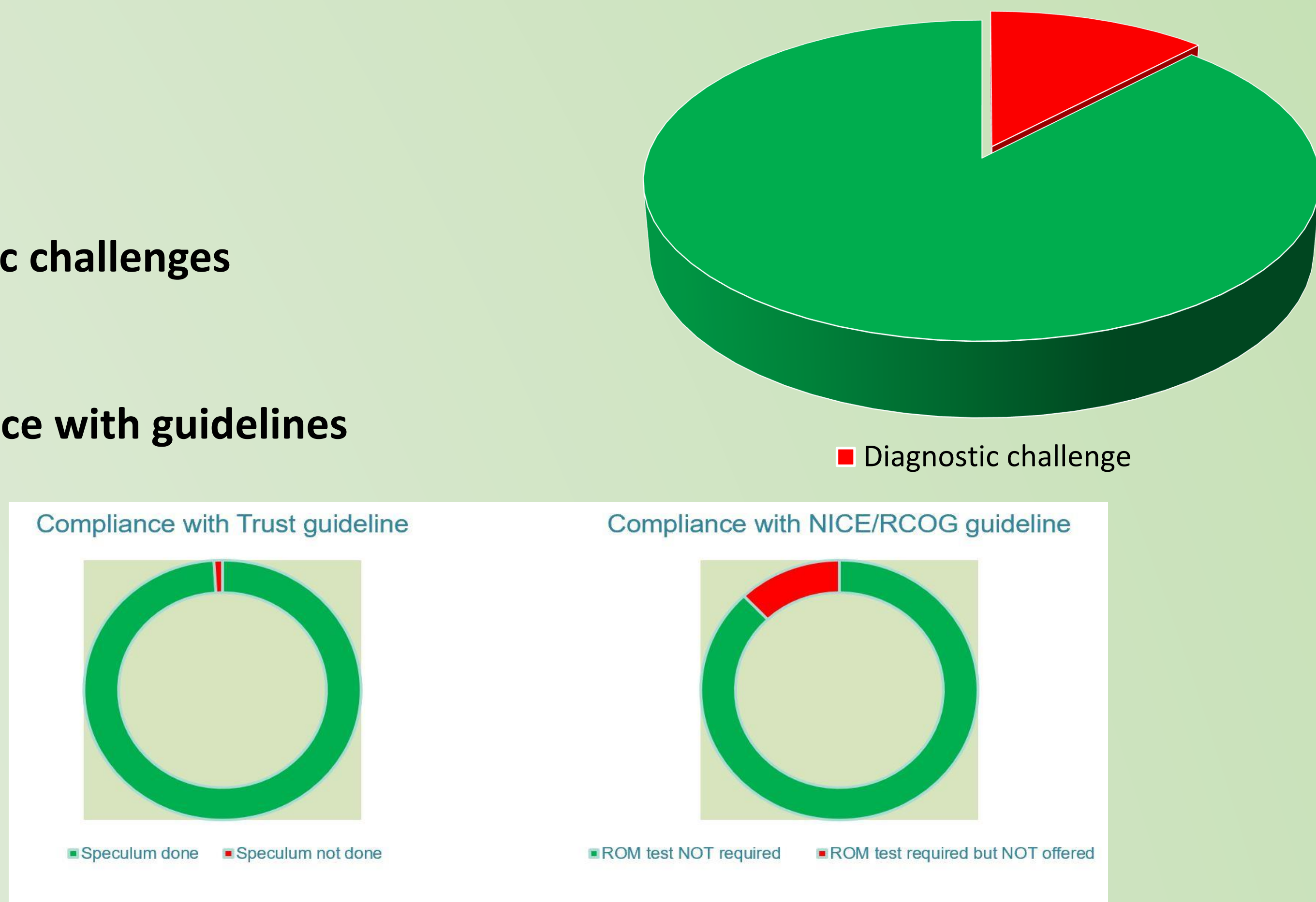


*calculation based on 3 day hospital admission, with USS examination

DISCUSSION:

1. Diagnostic challenges

2. Compliance with guidelines



3. Cost effectiveness

- One day admission cost is £527
- Ultrasound examination £159
- ROM test cost is £14, the specificity and sensitivity for the IGFBP-1 test are 100% and 98% respectively with PPV of 100% and NPV of 99%

CONCLUSIONS:

- None of the missed cases led to harm
- All cases of chorioamnionitis were identified and treated promptly
- Implementation of the IGFBP-1 test would improve diagnosis and quality of care, as it provides an option for patients where pooling of amniotic fluid cannot be confirmed on speculum examination or who decline speculum examination
- **Implementation of ROM test improves diagnosis and quality of patient service**
- Our analysis demonstrates cost effectiveness of this test in this setting

REFERENCE:

- 1.Mercer BM. Preterm premature rupture of the membranes. *Obstet Gynecol*2003;**101**:178–93.
- 2.Morris JM, Roberts CL, Bowen JPJ, Bond DM, Algert CS, Thornton JG, Crowther CA. Immediate delivery compared with expectant management after preterm pre-labour rupture of the membranes close to term (PPROMT trial): a randomised controlled trial. *Lancet* 2016;**387**:444–52.
3. Peaceman AM, Lai Y, Rouse DJ, Spong CY, Mercer BM, Varner MW, et al. Length of latency with preterm premature rupture of membranes before 32 weeks' gestation. *Am J Perinatol* 2015;**32**:57–62.
- 4.Dale PO, Tanbo T, Bendvold E, Moe N. Duration of the latency period in preterm premature rupture of the membranes. Maternal and neonatal consequences of expectant management. *Eur J Obstet Gynecol Reprod Biol* 1989;**30**:257–62
5. www.improvement.nhs.uk : MATERNITY PRICES 2019/2020 (Non-mandatory prices work-book 2019/2020)