Amsterdam UMC
University Medical Centers

Biomarkers in children with simple and complex appendicitis
A scoping and systematic review

SML The
Emma Childrens Hospital, Amsterdam UMC
Dpt. Paediatric Surgery, Amsterdam, the Netherlands

CMC de Beaufort
Emma Childrens Hospital, Amsterdam UMC
Dpt. Paediatric Surgery, Amsterdam, the Netherlands

JH van der Lee
Paediatric Clinical Research Office, Amsterdam, University Medical Centre, Amsterdam, The Netherlands

R Bakx
Emma Childrens Hospital, Amsterdam UMC
Dpt. Paediatric Surgery, Amsterdam, the Netherlands

JCF Ket
Medical Library, Vrije Universiteit, Amsterdam, The Netherlands

LWE van Heurn
Emma Childrens Hospital, Amsterdam UMC
Dpt. Paediatric Surgery, Amsterdam, the Netherlands

RR Gorter
Emma Childrens Hospital, Amsterdam UMC
Dpt. Paediatric Surgery, Amsterdam, the Netherlands

Introduction

Two types of appendicitis[1-3]
- **Simple** (uncomplicated)
- **Complex** (complicated)

Aim:
1. To identify biomarkers for accurate discrimination
2. To assess their diagnostic value
Especially LR- and specifity to rule out complex type

Methods

Search: Pubmed (Medline), EMBASE, and the Cochrane Library untill Nov 21st and Nov 29th, 2017

Inclusion criteria
- RCTs & cohort studies published ≥ 2000
- Paediatric population
- Histopathological confirmation of appendicitis

Outcome
1. Scoping: overview of biomarkers
2. Diagnostic: sensitivity, specificity, LR+/-, AUC

Discussion

Future suggestions
- Well-designed diagnostic studies of potential biomarkers
- Consensus meeting for definitions of complex appendicitis

61 biomarkers were identified to differentiate between simple and complex **appendicitis** in the **paediatric population**

However, available data is scarce and quality limited

Complex

Simple

Contact
Sarah-May The
s.the@amsterdamumc.nl
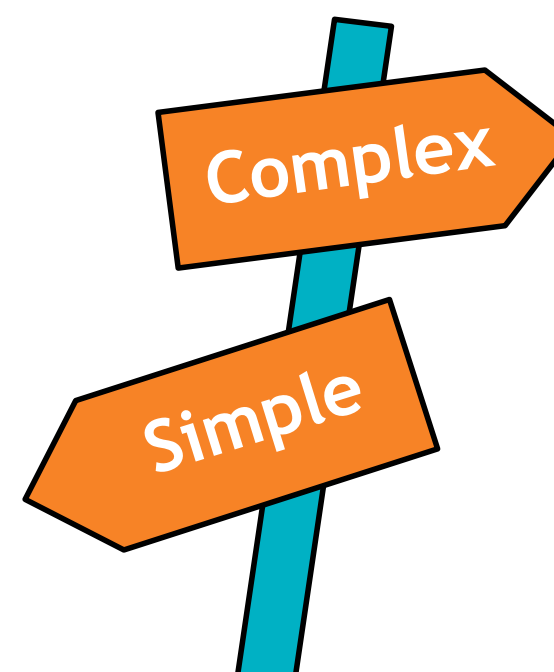
References 1-3: Bröker et al 2012, J Surg Res; Cobben et al 2000, Radiology; Ruber 2010, Surgery
References of included articles at QR code

Total number of biomarkers: 61
- Serum: (47)
- Urine: (12)
- Feces: (02)

Large heterogeneity of definitions reported

Articles (n=6286)

Full-text (n=275)

Scoping (n=33)

Diagnostic (n=15)

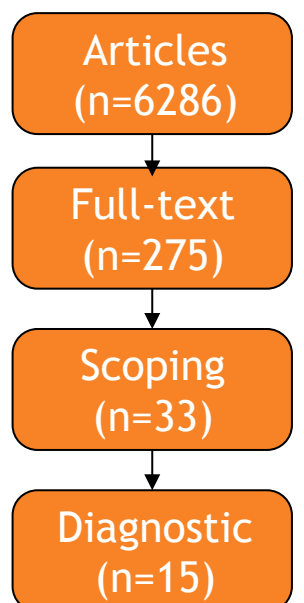**Table 1. C-reactive protein (n=10) and White Blood Cell (n=8)**

Biomarker	LR+	LR-	SN	SP	AUC
CRP	1.32-10	0.18-0.92	0.20-0.94	0.08-0.90	0.64-0.90
WBC	1.01-20	0.2-0.96	0.40-0.95	0.09-0.90	0.56-0.90

Table 2. Selected promising biomarkers

Biomarker	Study	LR+	LR-	SN	SP	AUC
Serum						
D-Dimer	*Bu (2016)*	6.07	0.44	0.607	0.900	0.679
	Cayrol (2016)	-	0.31	0.69	1.000	-
Il-6	*Ozguner (2014)*	4.00	0.30	0.76	0.81	0.859 (0.754-0.963)
Procalcitonin	*Suhaymi (2017)*	1.09	0.00	1.000	0.083	0.645
Urine						
Nitrate	*Chen (2013)*	10.00	0.82	0.20	0.97	-
RBC	*Chen (2013)*	4.67	0.56	0.56	0.78	0.620 (0.542-0.699)
WBC	*Chen (2013)*	2.33	0.76	0.35	0.85	0.561 (0.482-0.641)
Feces						
Lactoferrin	*Sarsu (2017)*	14.43	0.04	0.967	0.933	0.95

SN = sensitivity, SP = specificity, LR = likelihood ratio, AUC = area under the curve