Are there any Data to Help Refine the Diagnosis of Acute PID and Elucidation of Risk Factors?

CITATION	STUDY DESIGN	STUDY POP/TYPE/ SETTING	EXPOSURE/ INTERVENTION	OUTCOME MEASURE	REPORTED FINDINGS	DESIGN ANALYSIS/ QUALITY/BIASES	SUBJ QUALITY RATING
Wang Fertil Steril 2009	Case control	Taiwan 47 cases, 80 controls 2006-2007	Acute PID- CDC Criteria PLUS $\geq$ 1 of: temp, cx or vag mucopurulent disch, WBCs on wet mt, ESR, CRP, GC or CT	Matrix metalloproteinases MMP-2 and MMP-9 Gelatin zymography and ELISA	MMP-9 level elevated in PID (237 ng/ml v 97 ng/ml) MMP-2: no difference Cut-off of 115 ng/ML: -Sens 77%, spec 65%, PPV 56%, NPV 83%	Clinical criteria for PID only	Fair
Tsai Fertil Steril 2009	Case control	Taiwan 44 cases, 50 controls	Acute PID	Cathepsin B(cysteine protease) Cathepsin C (cysteine protease inhibitor) ELISA	Cath B sig elevated in PID (Means 21.70 +/- 1.57 ng/ml vs 14.19 +/- 0.77) Cath C sig decr in PID (706 vs 873 ng/ml)	No ROC No discriminatory level proposed Clinical criteria for PID only	Fair
Risser Int J STD AIDS 2009	Review	13 studies		Vaginal WBCs Cervical mucopus	Post-test probability of PID: - Vag or Cx WBCs: 50%-73%	Lit review	Fair
Taylor-Robinson Int J STD AIDS 2009	Historical cohort	London, UK 1980's cohort 112 women with pain 22 women had LS confirmed salpingitis	C. trachomatis Ab- MIF	LS-confirmed PID	64% of LS-confirmed PID had elevated AB levels 35-55% considered likely to have acute PID (clinically) had LS confirmation	Cohort prior to 1990 Suboptimal test sens/spec for CT Only 22 women with LS-confirmed salpingits	Fair

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Maleckiene Int I Gynaecol Obstet 2009	Convenience sample	Lithuamia N=73	Acute PID- clinical	Laparoscopy confirmation of salpingitis	LS confirmation- 71% Sens Spec PPV VagDis 60% 76% 86% Temp 25% 81% 77% WBC 48% 76% 83% CRP 75% 52% 80%	Time frame not given	Fair
Wang Reprod Sci 2010	Case Control	Taiwan 2006-2009 62 cases, 70 healthy controls	Acute PID- CDC Criteria PLUS $\geq$ 1 of: temp, cx or vag mucopurulent disch, WBCs on wet mt, ESR, CRP, GC or CT	Plasmaosteopontin in plasma by ELISA and PCR	Sig elevated (mean) in PID v controls (103 v 65 ng/ml) Declined following Tx > 58.5 ng/ml: Sensitivity 83% Specificity 60%	Clinical criteria for PID only	Fair
Tsai Reprod Sci 2009	Case control	Taiwan 2006-2007 44 cases, 50 controls	Acute PID- clinical criteria	Plasma stromal cell-derived Factor 1 Protein- ELISA and PCR on plasma	Sig elevated mean levels in PID v controls (2667 v 1774 pg/ml) Normalized post-tx >2192 pg/ml: Sens 77%, Spec 88%, PPV 85%, NPV 82%	Clinical criteria for PID only	Fair
Lee Fertil Steril 2010	Case control	Taiwan 2006-2007 44 cases, 50 controls	Acute PID- clinical criteria	Plasma myeloperoxidase protein in PID pts with A allele myeloperoxidase gene polymorphism ELISA PCR-RFLP	Myeloperoxidase sig elevated in PID v controls (88 v. 57 ng/ml) Normalized post Tx Pts with myeloperoxidase G/A alleles (but not G/G homozygous) assoc with elevated myeloperoxidase levels	Clinical criteria for PID only	Fair

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Hsiao Reprod Sci 2010	Case control	Taiwan 2006-2009 64 cases 70 controls	Acute PID- CDC Criteria PLUS $\geq$ 1 of: temp, cx or vag mucopurulent disch, WBCs on wet mt, ESR, CRP, GC or CT	Plasma monocyte chemotactic protein-1- ELISA and PCR-RFLP	MCP-1 mean levels sig increased in PID v. controls (379 v. 209 pg/ml Normalized post tx	Clinical Dx of PID No cut-off for diagnostic test	Fair
Chang Clin Chem Lab Med 2011	Case control	Taiwan 2006-2007 64 cases 70 controls	Acute PID- clinical criteria	Plasma Pentraxin 3- ELISA	PTX3 sig elecated c/w controls (9.3 v 2.3 ng/ml, $p<0.001$). Cutoff of 2.87 ng/ml: Sens 84%, Spec 81%, PPV 81%, NPV 85%	Clinical Dx of PID Lab staff blinded to clinical info	Fair
Yeh Clinica Chimica Acta 2012	Case control	Taiwan 2006-2011 64 cases 70 controls	Acute PID- clinical criteria	Urokinase-type plasminogen activator uPA), soluble urokinase-type plasminogen activator receptor (suPAR), plasminogen activator inhibitor-1 (PAI-1)	uPA and soluble suPAR were sig increased in PID c/w controls PAI-1 not different	Clinical dx of PID Overlap betw PID and controls	Fair
Lee J Clin Lab Analysis 2012	Case control	Taiwan 2006-2007 64 cases 70 controls	Acute PID- clinical criteria	Plasma YKL-40 (plasma glycoprotein secreted by activated macrophages, neutrophils etc.	Plasma YKL-40 sig elevated in PID (38 vs. 22, $p=0.001$) Only sig elevated in >30 y.o. Cut-off 24.8 in > 30 y.o.: Sens 78%, Spec 80%	Clinical dx of PID Only in > 30 y.o.	Fair

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Tsai Clinica Chimica Acta 2011	Case control	Taiwan 2006-2007 64 cases 70 controls	Acute PID- clinical criteria	Neutrophil geatinase associated lipocalin (NGAL) and NGAL-MMP-9 complex	Plasma NGAL and NGAL/MMP-9 elevated in PID v. controls Normalized post tx Cut-offs: NGAL 10.04 ng/ml and NGAL/MMP-9 2.33 ng/ml: Sens 77% and 78% and NPV 73% and 75%	Clinical Dx of PID	Fair
Tsai Fertil Steril 2013	Case control	Taiwan 2006-2011 64 cases 70 controls	Acute PID- CDC Criteria PLUS $\geq$ 1 of: temp, cx or vag mucopurulent disch, WBCs on wet mt, ESR, CRP, GC or CT	Plasma soluble E-cadherin level and E-cadherin polymorphism - ELISA and PCR-RFLP	Plasma E-cadherin elevated in PID v controls (24.6 v 14 ng/ml) Normalized post tx Cut-off 20.22 ng/ml: Sens 81%, Spec 80%, PPV 78%, NPV 82% No assoc with E-cadherin genotypes and PID		Fair
Abujudeh AJR 2011	Prospective observational Convenience sampling (when coordinator present)	MGH- Harvard 2006-2008 Nontraumatic abd pain who underwent abdominal CT $\geq$ 18 y.o. n=584 (83 excluded)	Abdominal CT Physician's assessment of diagnostic certainty		Pre- CT Dx of PID: n=5. Post-CT: n=19 70% increase in diagnostic certainty	Convenience sample No gold std for Dx Diagnostic criteria not described Too few pts with PID	Fair
Jung J Obstet Gynaecol Res 2011	Prospective observational	Korea 2007 Emergency Dept-nontraumatic acute abd pain N=308 Acute PID: Clinical and 1 of: temp, disch, WBC, ESR,	CT evidence of acute PID: pelvic peritonitis (incr attenuation and stranding of pelvic fat), salpingitis (tortuous tubal thickening), oophoritis (multiple small follicles within enlarged ovary),	Acute PID: n=48	Most specific findings: tubal thickening (spec >90%) Sensitivity for any finding $\leq$ 60%	Excluded IUD, hx IBD or GYN illness, recent GYN surgery No F/U data on 105 Bimanual only done on 116 (61%) Sample selection Retrospective analysis	Fair

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		CRP, GC, CT	endometritis (abnl endometr enhancement), free fluid				
Ozbay Eur J Obstet Gynecol Reprod Biol 2011	Cross sectional Convenience sample	Turkey Acute PID- clinical criteria (pain, CMT, ut and and tenderness, vag disch) N=26 TOA excluded	Transvaginal color Doppler ultrasound	Doppler measurements- Days 1,7,15,30	Low resistance prior to Tx, increasing resistance during treatment	No comparison group Clinical criteria only- no gold standard Only mild PID Small cohort	Fair
Mugo Infect Dis Obstet Gynecol 2011	Cross-sectional Retrospect analysis	Kenya Acute PID- LS-confirmed	LS-confirmed acute PID	Endometrial histology and HIV-1 infection status	MOD/SEVERE PID (sens): $\geq$1 PC: HIV+ 91%, HIV- 78% $\geq$1 PC & $\geq$3 PMN: HIV+74%, HIV- 63% (spec 75%, PPV 85%) MILD PID (sens): $\geq$1 PC: HIV+: 100%, HIV-:36% $\geq$1 PC & $\geq$ 3 PMN: HIV+:57%, HIV-:16% PMN density correl with severity of PID in HIV neg (but not in HIV+) PCs correlated with severity of PID in HIV+ (but not HIV -)	57% of HIV+ women had unevaluable endometrial bx	Good

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Demirtas Arch Gynecol Obstet 2013	Retrospec review	Turkey 2006-2011 Acute PID- clinical criteria (incl fever, WBC, or ESR) TOA: n=44 PID: n=29	Predicting TOA	CRP, ESR	66% with TOA underwent surgery LOS: TOA >4 cm: 13d TOA ≤4 cm: 8.8d PID: 4.8d CRP and ESR incr in TOA Cut-offs: CRP 11.5 mg/L: Sens 72%, spec 63% ESR 19.5 mm: sens 79%, spec 83%	Mean age of PID: 41 yrs	Fair