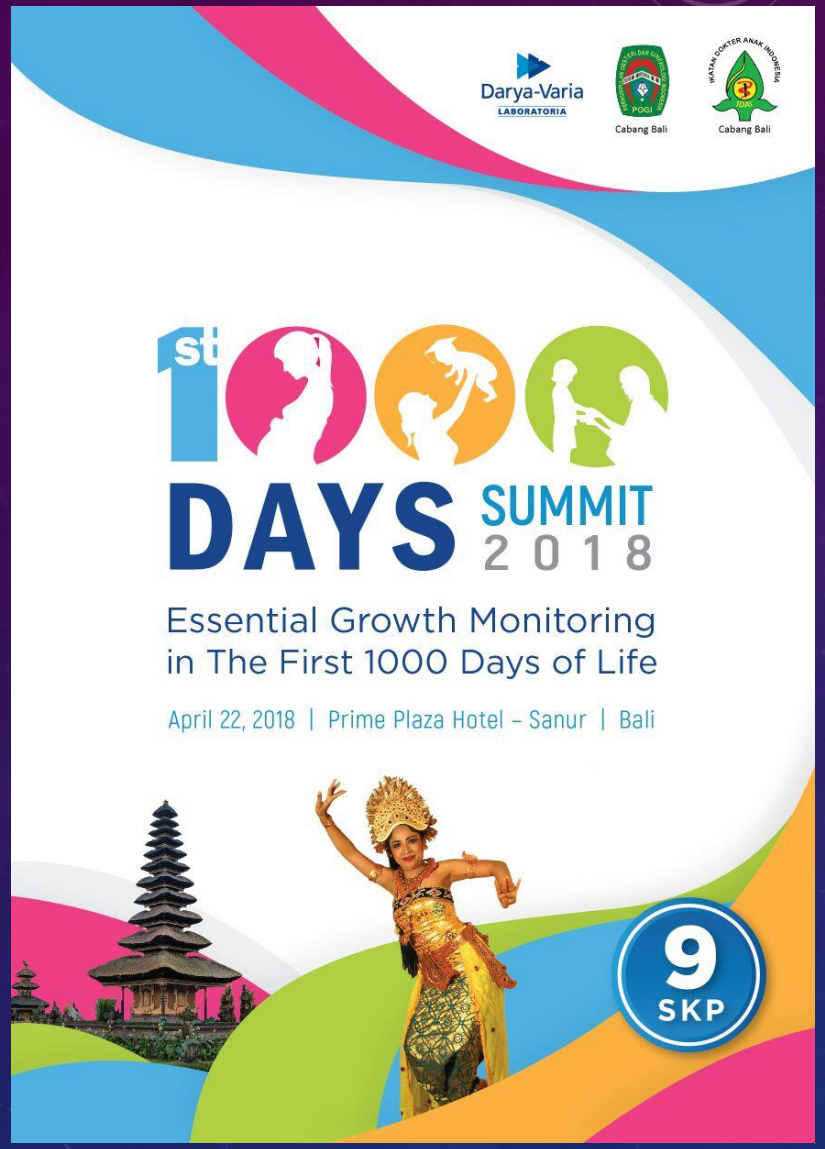


Azen Salim
Gulardi Center, Jakarta.

Preterm birth

- Topik utama kehamilan karena kelahiran preterm merupakan penyumbang nomor satu kematian neonatal dan diikuti kematian anak dibawah lima tahun

1. Berghella V (ed). *Preterm birth prevention and management*. Oxford, UK: Wiley-Blackwell, 2010.
2. Lackritz EM, et al. A solution pathway for preterm birth: Accelerating a priority research agenda. *Lancet*. 2013.

Preterm birth (PTB)

Birth between 20 – 36^{+6} weeks

- Very early PTB : birth between 20 and 23^{+6} weeks
- Early PTB : birth between 24 -33^{+6} weeks
- Late PTB : birth between 34 – 36^{+6} weeks

Preterm labor

- Adanya kontraksi rahim ≥ 4/20 menit atau ≥ 8/jam
- USG transvaginal < 20 mm atau 20 – 29 mm dengan fetal fibronectin positif

Ness A, et al. Does knowledge of cervical length and fetal fibronectin affect management of women with preterm labor? A randomized trial . *Am J Obstet Gynecol*. 2007;197:426.

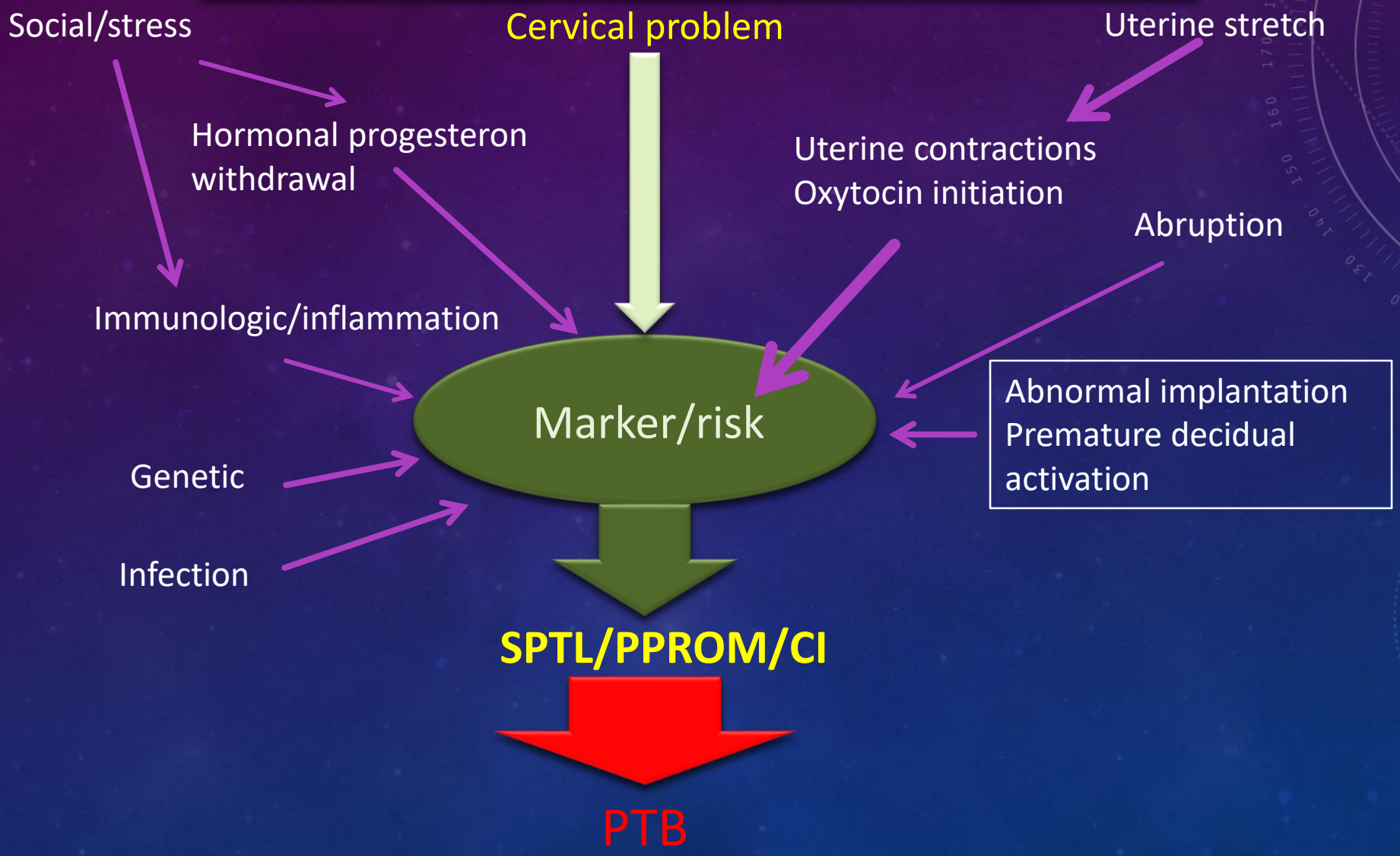
Kejadian PTB

- Global berkisar 5 – 18%
- Indonesia 15% (2010 Unicef)
- Kematian neonatal 14 per 1000 kelahiran hidup (2015)
- Kematian anak dibawah 5 tahun 27 per 1000 kelahiran hidup

Kematian karena PTB WHO 2012

1. India
2. Nigeria
3. Pakistan
4. China
5. Democratic Republic of Congo
6. Bangladesh
7. Ethiopia
8. Indonesia

Multifactorial interactions



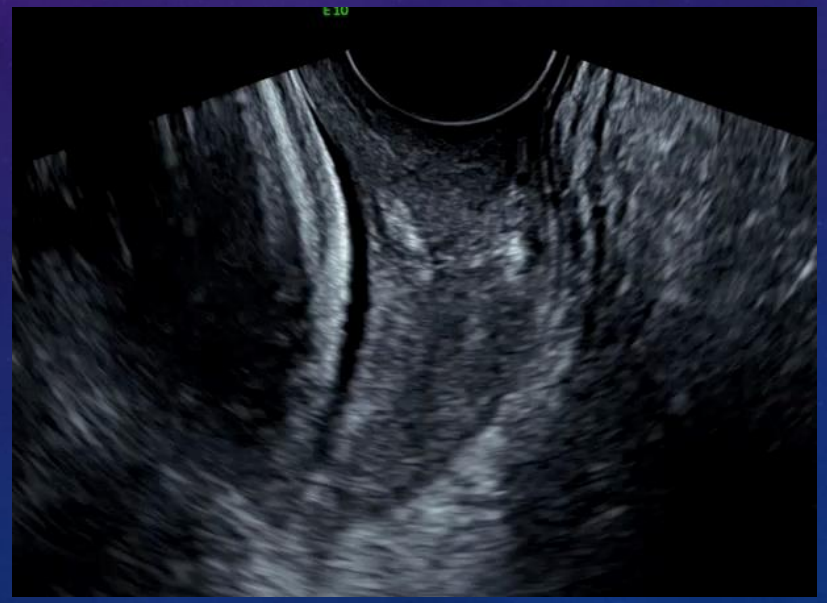
Four main risk factors

1. Smoking
2. Short CL TVUS
3. A prior SPTB
4. Asymptomatic bacteriuria

ULTRASONOGRAFI UNTUK MEMPREDIKSI PERSALINAN PRETERM

CERVIX

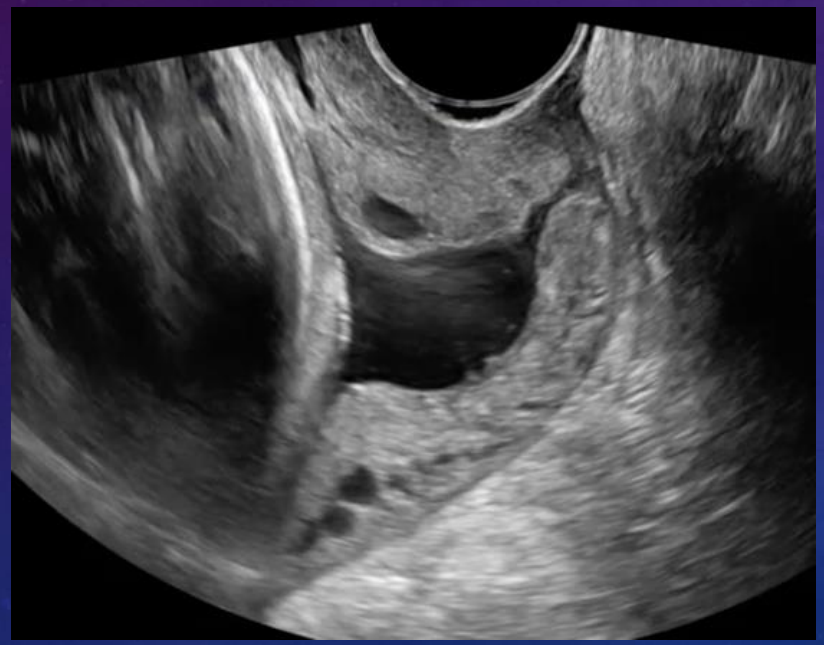
- Ostium internum
- Canalis cervicalis
- Ostium externum

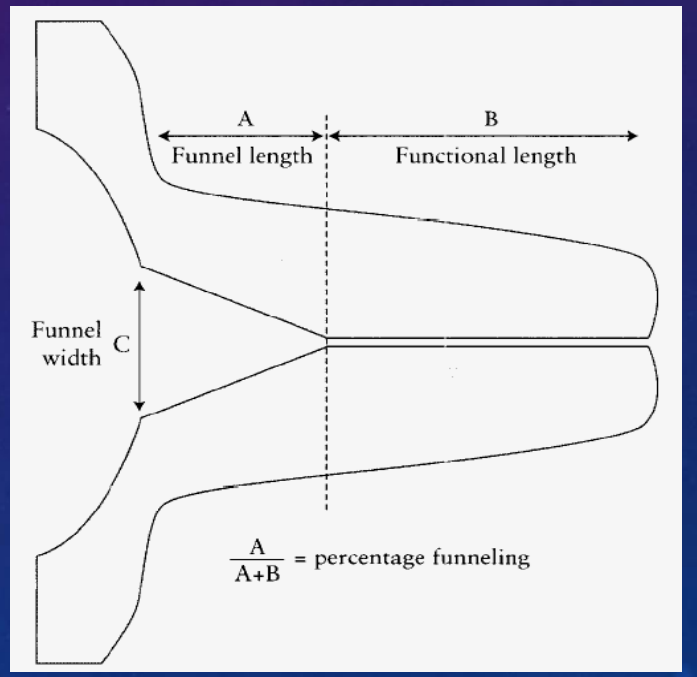


Pemeriksaan panjang cervix diusia kehamilan 18-24mgg sebaiknya dilakukan pada kehamilan tunggal tanpa ada riwayat partus preterm. Kalau panjang cervix $\leq$ 25 mm disarankan progesterone vaginal sampai 36 minggu.

Suhag A, et al. Vaginal progesterone for maintenance tocolysis: A systematic review and meta-analysis of randomized trials. *Am J Obstet Gynecol*. 2015;213(4):479–87.

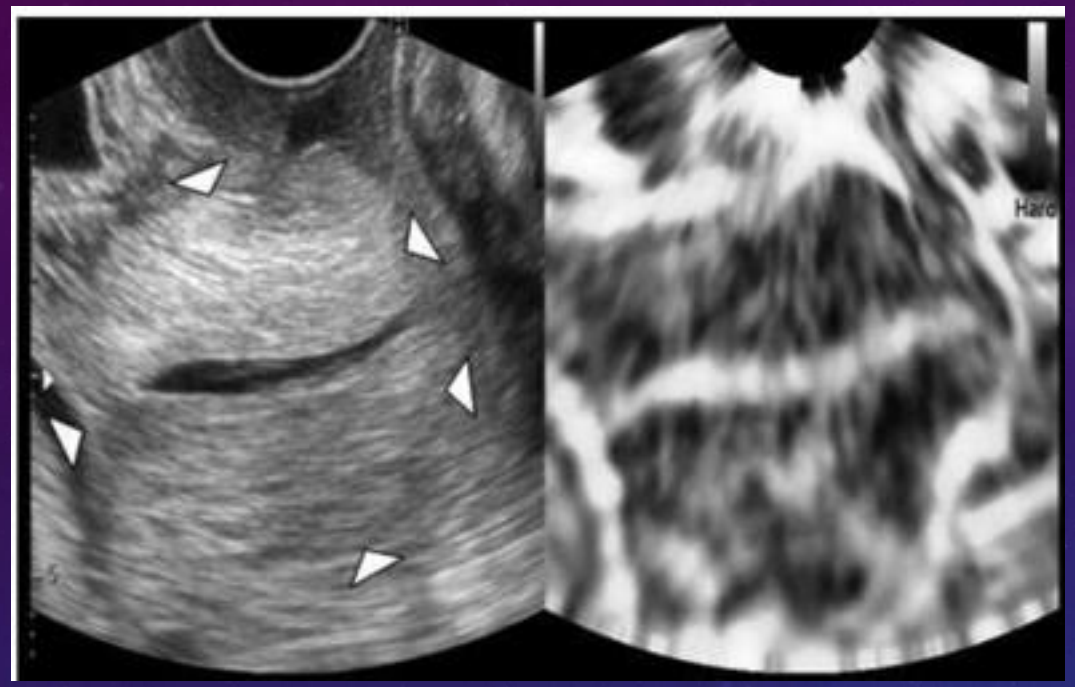
Cara penilaian perubahan kanalis servikalis

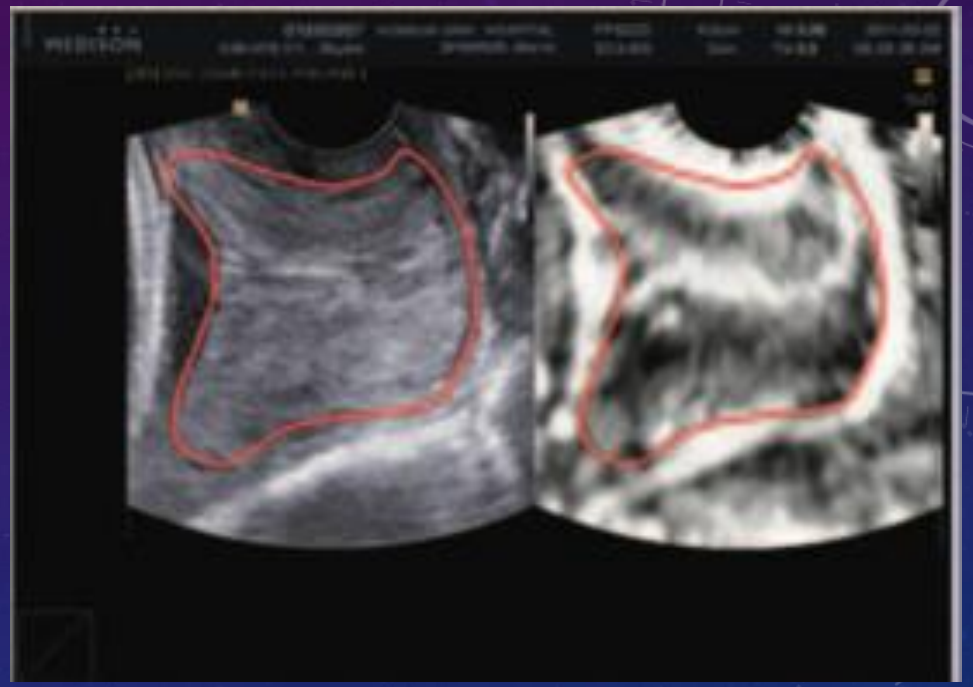




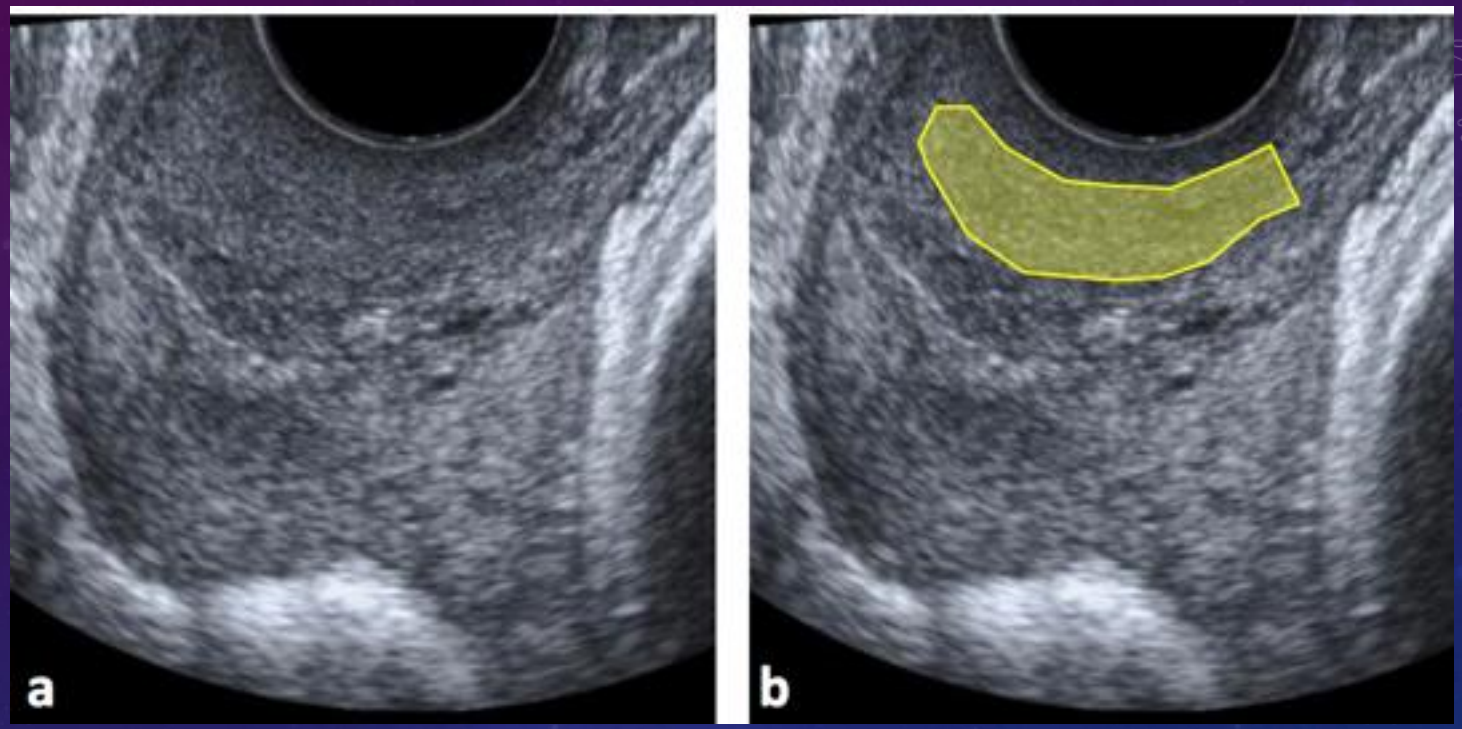
Kelenturan jaringan cervix

Elastography



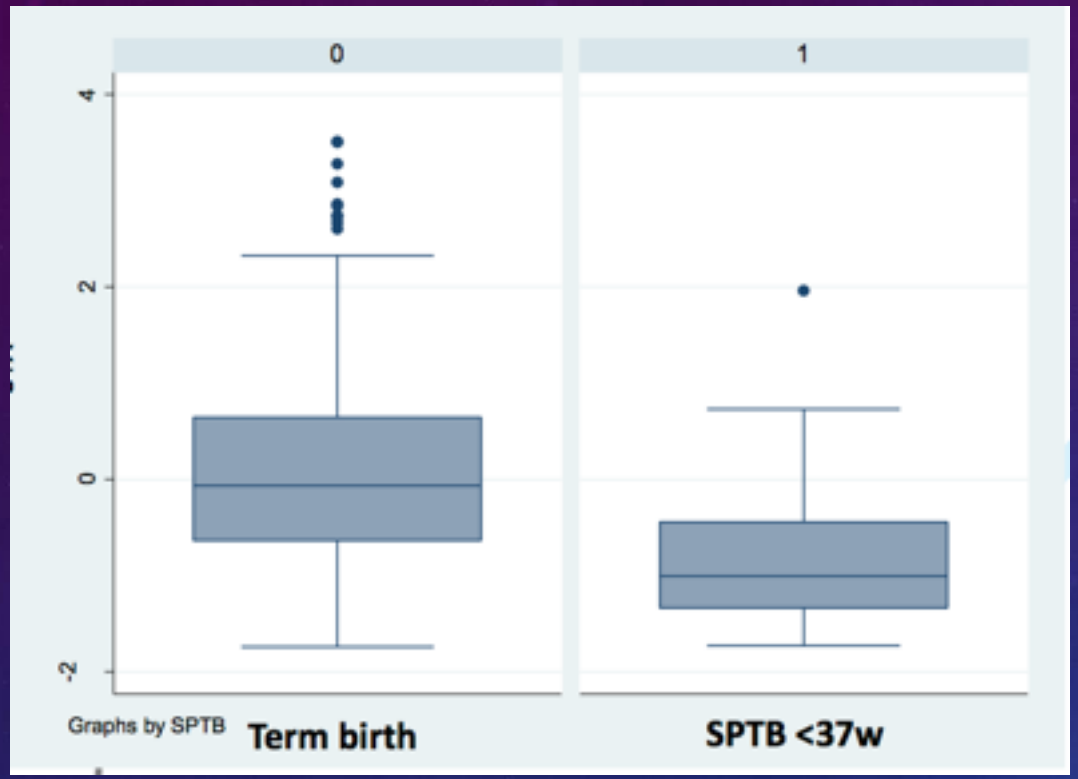


Hwang et al. J Ultrasound Med 2013; 32:937–946



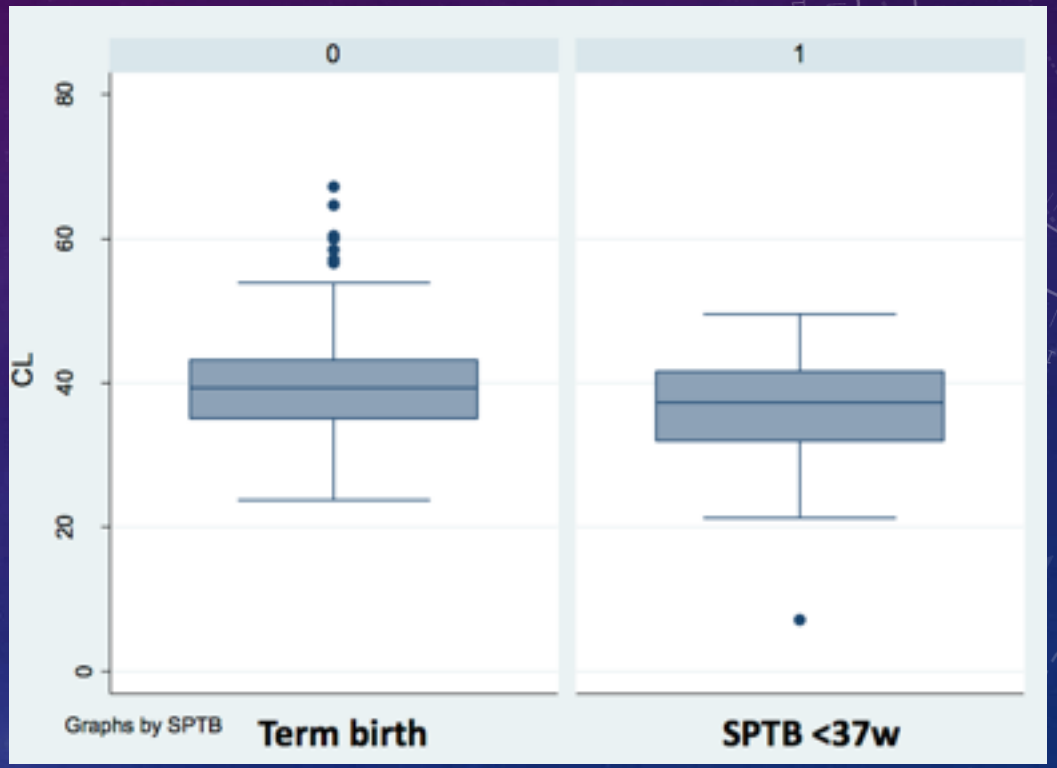
Ba-os, et al. Ultrasound Obstet Gynecol 2017

CTx-based score



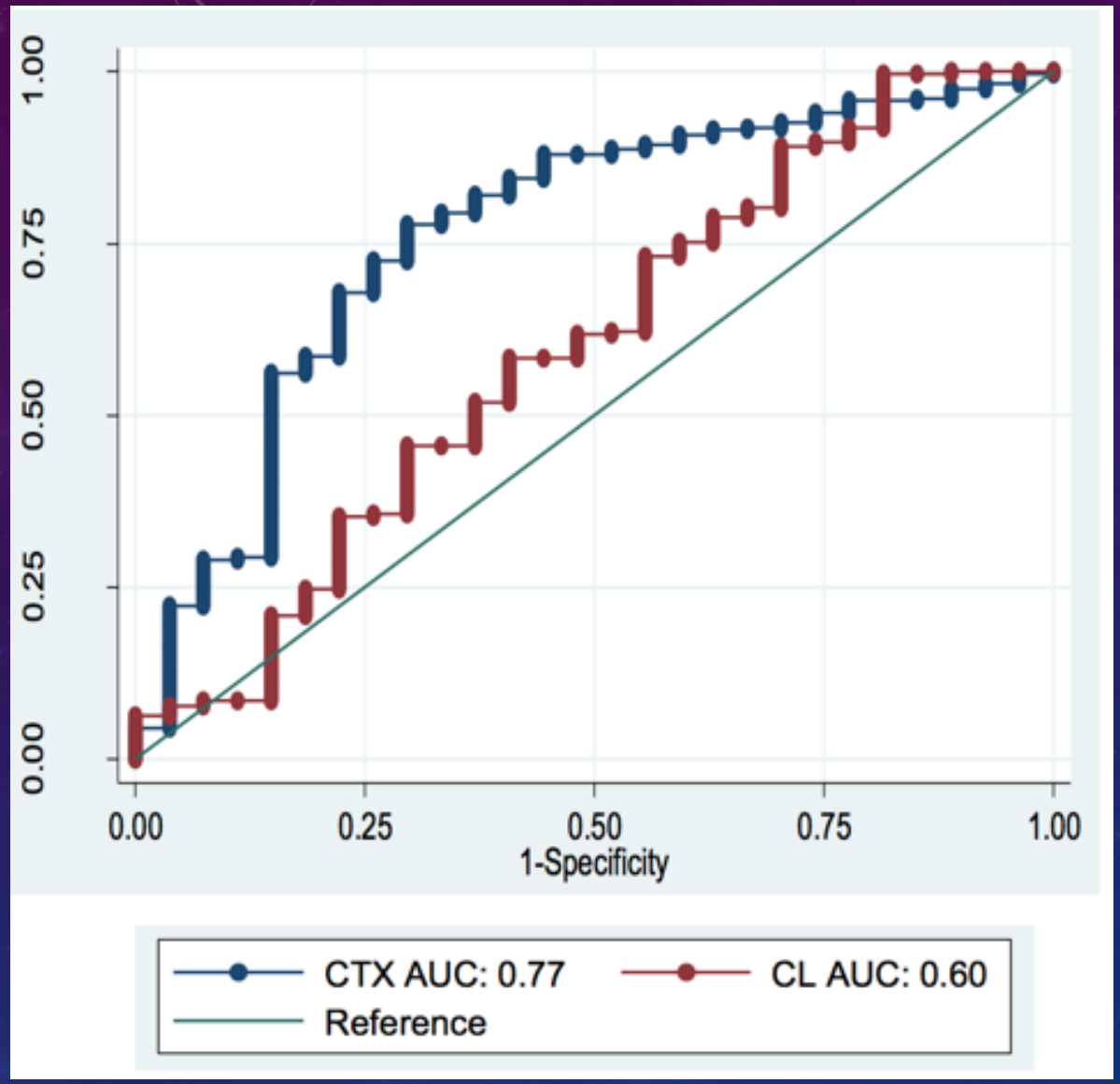
-0.07 vs -1.01 (p<0.001)

CL



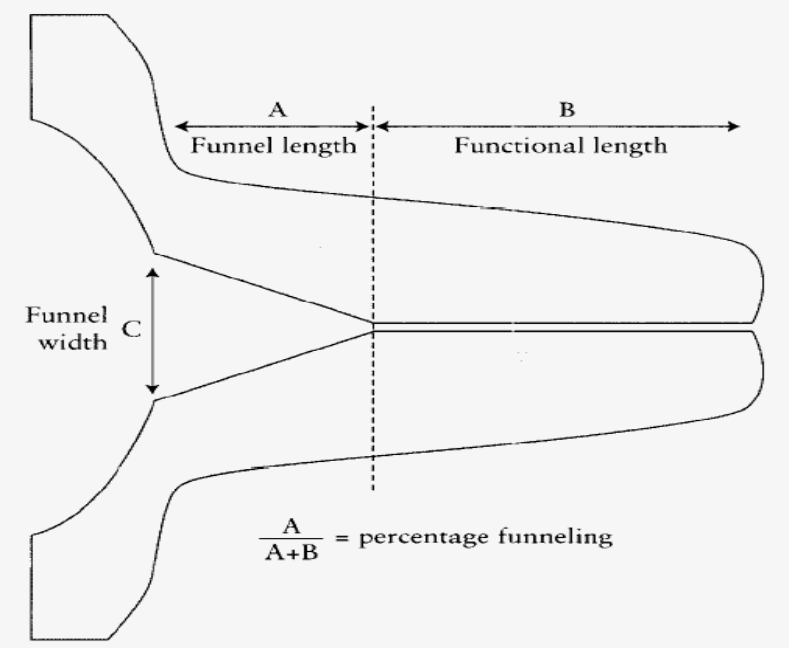
38.6 vs 37.7 (p=0.26)

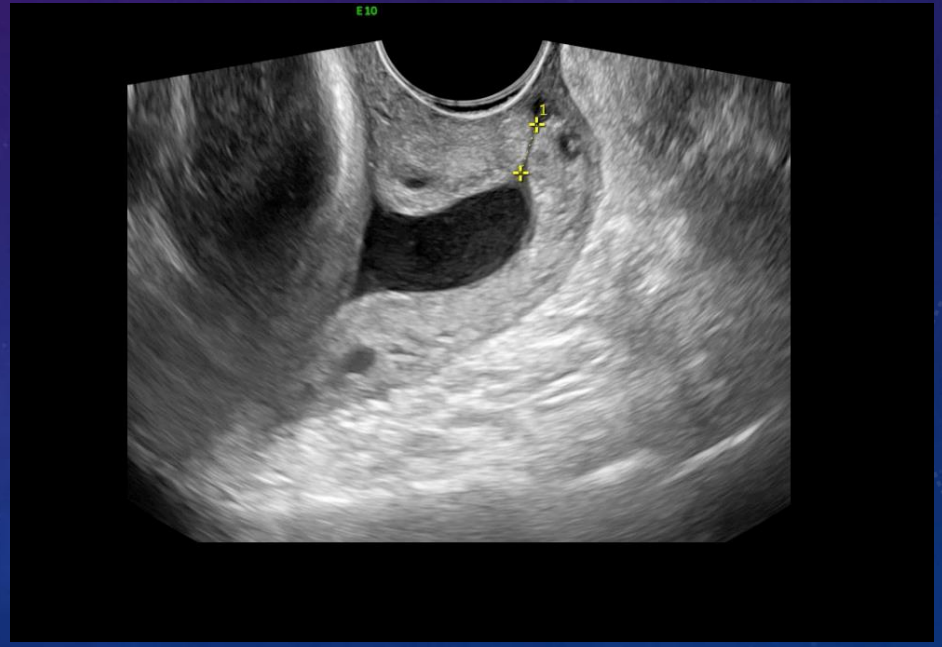
Ba-os, et al. Ultrasound Obstet Gynecol 2017



Ba-os, et al. Ultrasound Obstet Gynecol 2017.

Funneling of the cervical canal





AMNIOTIC SLUDGE

- Adanya materi putih tersebar atau berkelompok seperti endapan didaerah sekitar ostium internum

Adanya partikel ekoik yang berada disekitar OUI dikenal sebagai *Amiotic Fluid sludge* menambah risiko :

- **Kecendrung terjadi partus preterm**
- **Terdapatnya khorio amnionitis secara histologi pada kejadian partus preterm spontan dengan selaput ketuban masih utuh**
- **Invasi mikroorganism kedalam rongga amnion(*Microbial Invasion of Amniotic Cavity =MIAC)***
- **Riwayat persalinan preterm**
- **Ancaman terjadinya persalinan preterm**

1. Espinoza J, et al. The prevalence and clinical significance of amniotic fluid ‘sludge’ in patients with preterm labor and intact membranes. *Ultrasound Obstet Gynecol* 2005; **25**: 346–352.
2. Bujold E, et al. Intra-amniotic sludge, short cervix, and risk of preterm delivery. *J Obstet Gynaecol Can* 2006; **28**: 198 – 202.

AF sludge(endapan) merupakan ;

- **Kelompok koloni mikro-organisme berupa bakteri dan sel-sel radang dibuktikan dengan kultur adanya mikroorganisme didalam air ketuban ataupun sel darah putih > 50 sel/mm^{3}.**
- **Sering terdapat pada kehamilan tanpa gejala**

Romero R, et al. Amniotic fluid white blood cell count: a rapid and simple test to diagnose microbial invasion of the amniotic cavity and predict preterm delivery. *Am J Obstet Gynecol* 1991; **165**: 821–830.

Karakteristik dari "amniotic sludge"

- Kadar glukosa rendah(<10mg/dL)
- Jumlah leukosit mendekati 20ribu/mm^3
- Coccus gram positif

Hasil kultur amniotic sludge

1. Mycoplasma hominis
2. Streptococcus mutans
3. Aspergillus flavus
4. Ureaplasma urealyticum
5. Staphylococcus aureus
6. Fusobacterium nucleatum

ECHOGENIC AMNIOTIC FLUID

- Kejadian sekitar 4% di trimester pertama dan kedua*
- Mencapai 88% pada usia kehamilan 35 minggu**

- Zimmer EZ, Bronshtein M. Ultrasonic features of intra-amniotic ‘unidentified debris’ at 14–16 weeks’ gestation. *Ultrasound Obstet Gynecol* 1996; **7**: 178–181.

Parulekar SG. Ultrasonographic demonstration of floating particles in amniotic fluid. *J Ultrasound Med* 1983; **2: 107–11

ECHOGENIC AMNIOTIC FLUID

- Pada trimester pertama dan kedua – dihubungkan dengan perdarahan intraamniotic[#] dan kasus acranii*[$]
- Juga didapatkan pada kehamilan dengan kadar serum alpha protein maternal meninggi[1]
- Kondisi fisiologis pada trimester ketiga karena adanya vernix caseosa[@] dan/atau meconium[%]

[#] Sepulveda W, et al. Second-trimester echogenic bowel and intraamniotic bleeding: association between fetal bowel echogenicity and amniotic fluid spectrophotometry at 410 nm. *Am J Obstet Gynecol* 1996; **174**: 839–842.

* Cafici D, Sepulveda W. First-trimester echogenic amniotic fluid in the acrania-anencephaly sequence. *J Ultrasound Med* 2003; **22**: 1075–1079.

[$]Timor-Tritsch IE, et al. Exencephaly-anencephaly sequence: proof by ultrasound imag- ing and amniotic fluid cytology. *J Matern Fetal Med* 1996; **5**: 182 – 185.

LANJUTAN

- Kondisi fisiologis pada trimester ketiga karena adanya vernix caseosa dan/atau meconium[1-4]

1. Benacerraf BR, Gatter MA, Ginsburgh F. Ultrasound diagnosis of meconium-stained amniotic fluid. *Am J Obstet Gynecol* 1984; **149**: 570 – 572.
2. Sepulveda WH, Quiroz VH. Sonographic detection of echogenic amniotic fluid and its clinical significance. *J Perinat Med* 1989; **17**: 333–335.
3. DeVore GR, Platt LD. Ultrasound appearance of particulate matter in amniotic cavity: vernix or meconium? *J Clin Ultrasound* 1986; **14**: 229–230.
4. Sherer DM, Abramowicz JS, Smith SA, Woods JR Jr. Sono- graphically homogeneous echogenic amniotic fluid in detecting meconium-stained amniotic fluid. *Obstet Gynecol* 1991; **78**: 819 – 822.

Kasus acranii anencephalus

LANJUTAN

- Menandakan kematangan paru janin intra-uterine berdasarkan pemeriksaan lecthin sphyngomyeline ratio

1. Gross TL, Wolfson RN, Kuhnert PM, Sokol RJ. Sonographically detected free-floating particles in amniotic fluid predict a mature lecithin–sphingomyelin ratio. *J Clin Ultrasound* 1985; **13**: 405 – 409.
2 Mullin TJ, Gross TL, Wolfson RN. Ultrasound screening for free-floating particles and fetal lung maturity. *Obstet Gynecol* 1985; **66**: 50–54.

Gambaran air ketuban dengan vervix caseosa kehamilan aterm

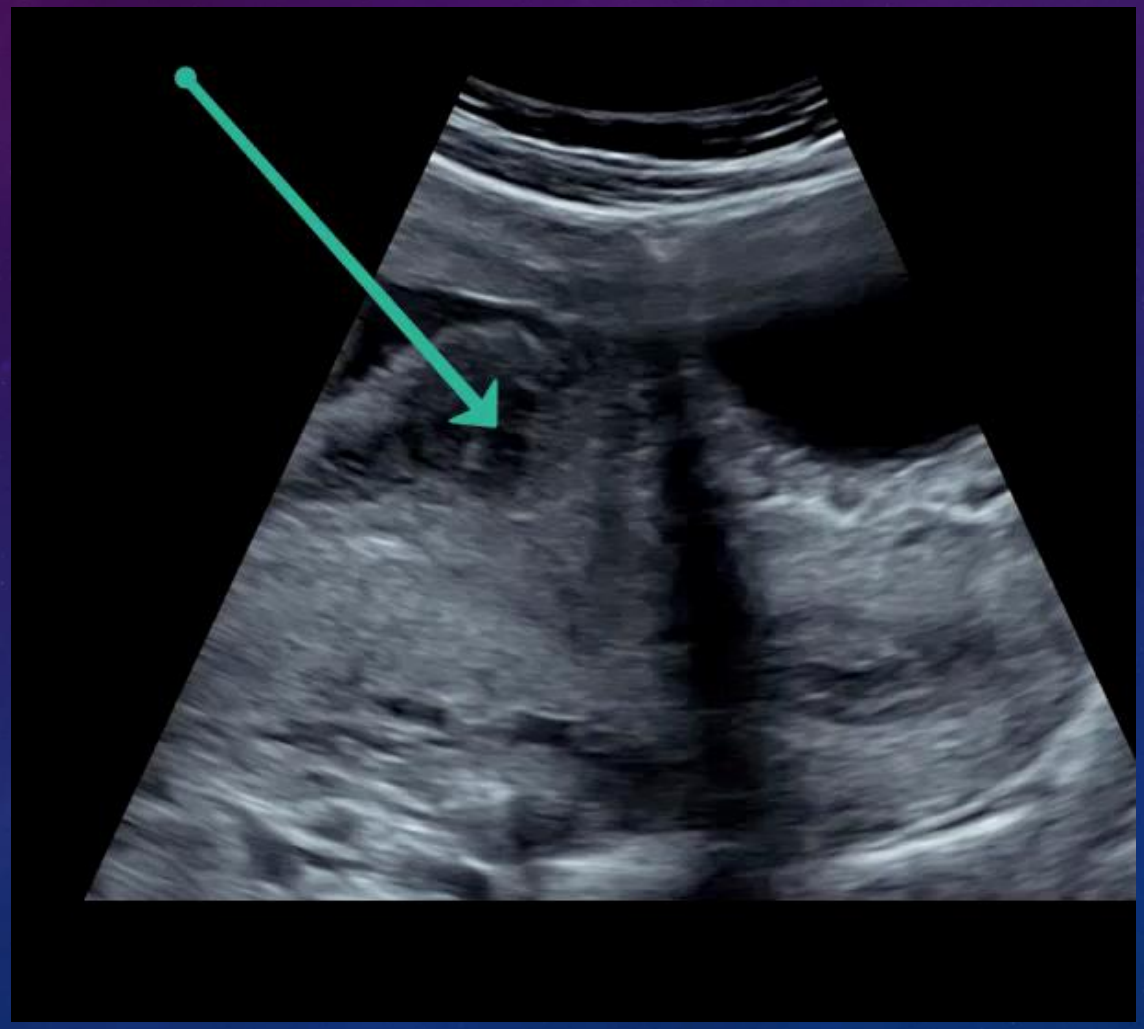
Transvaginal sonografi

Masih merupakan salah satu alat diagnostik yang sangat berperan untuk menentukan ukuran panjang dan bentuk perubahan dari cervix

Mempunyai nilai prediktif value yang tinggi serta nilai prediktif negatif yang bagus sekali

Sangat membantu menentukan indikasi cerclage

Perdarahan intra-uterine



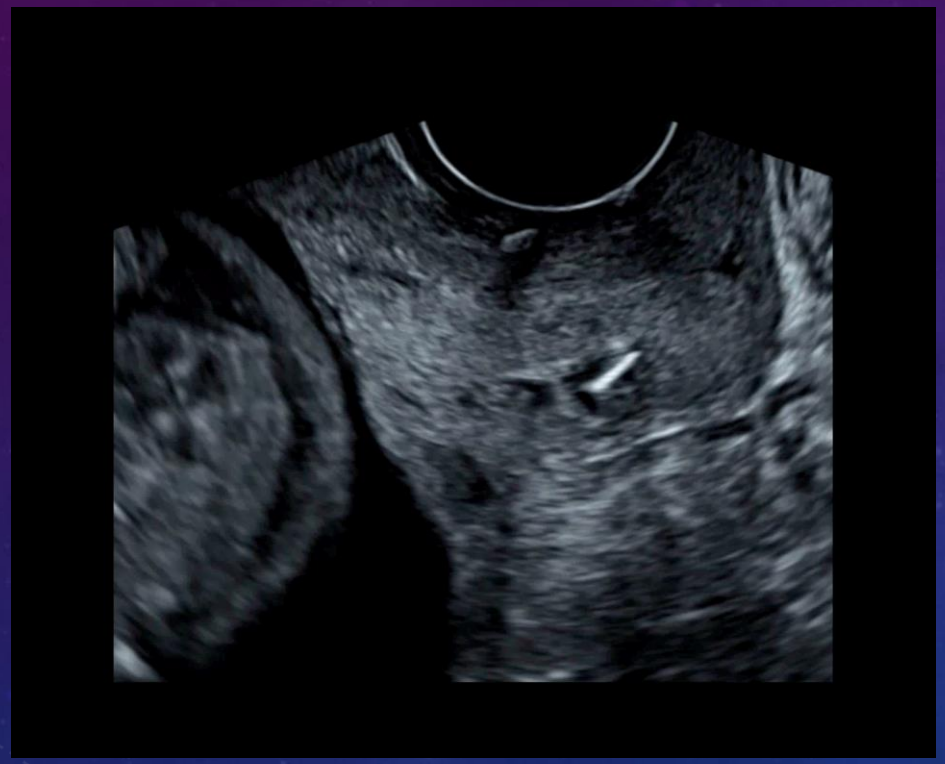
Nilai tambah pemeriksaan cervix

Canalis cervix memendek diusia kehamilan 26 minggu

G2P0A1(triplet) 20mgg.
Hamil spontan, dirujuk oleh TS dari Sumsel dengan pemendekan cervix.

Kehamilan 36 minggu dengan cerclage canalis cervix 6 mm

Posisi cerclage yang terlalu rendah



G2P1A0H0 riwayat keguguran 28 minggu dengan pemendekan cervix dilakukan cerclage gagal, pecah ketuban.
Gambar sebelah kondisi cerclage sekarang. Bagaimana tanggapan TS?

Table 3 Outcome variables according to the presence of amniotic fluid 'sludge'

Outcome variable	*No 'sludge' (n = 65)*	*'Sludge' present (n = 19)*	P
Clinical chorioamnionitis	1.5 (1/65)	10.5 (2/19)	NS
Positive amniotic fluid cultures	2.5 (1/40)	33.3 (6/18)	0.003*
Histological chorioamnionitis	19.0 (11/58)	77.8 (14/18)	< 0.001*
Composite of neonatal morbidity	13.8 (9/65)	36.8 (7/19)	0.04*
Admission to NICU	12.9 (8/62)	64.3 (9/14)	< 0.001*
Perinatal death	4.6 (3/65)	36.8 (7/19)	0.001*
Spontaneous delivery			
Within 48 h	4.4 (2/45)	42.9 (6/14)	0.001*
Within 7 days	15.6 (7/45)	71.4 (10/14)	< 0.001*
< 32 weeks	25.8 (8/31)	75.0 (9/12)	0.005*
< 35 weeks	37.8 (17/45)	92.9 (13/14)	< 0.001*

Data are expressed as percentage (number). *$P < 0.05$. NICU, neonatal intensive care unit; NS, not significant.

Kusanovic JP et al. Clinical significance of the presence of amniotic fluid sludge in asymptomatic patients at high risk for spontaneous preterm delivery. Ultrasound Obstet Gynecol 2007;30:706-714.

Korelasi panjang cervix dengan amniotic sludge

Cervical length	Percentage of sludge	N
< 5 mm	69	20/29
< 15 mm	49	33/68
< 25 mm	35	49/142
> 30 mm	12	12/99

Kusanovic JP et al. Clinical significance of the presence of amniotic fluid sludge in asymptomatic patients at high risk for spontaneous preterm delivery. Ultrasound Obstet Gynecol 2007;30:706-714.

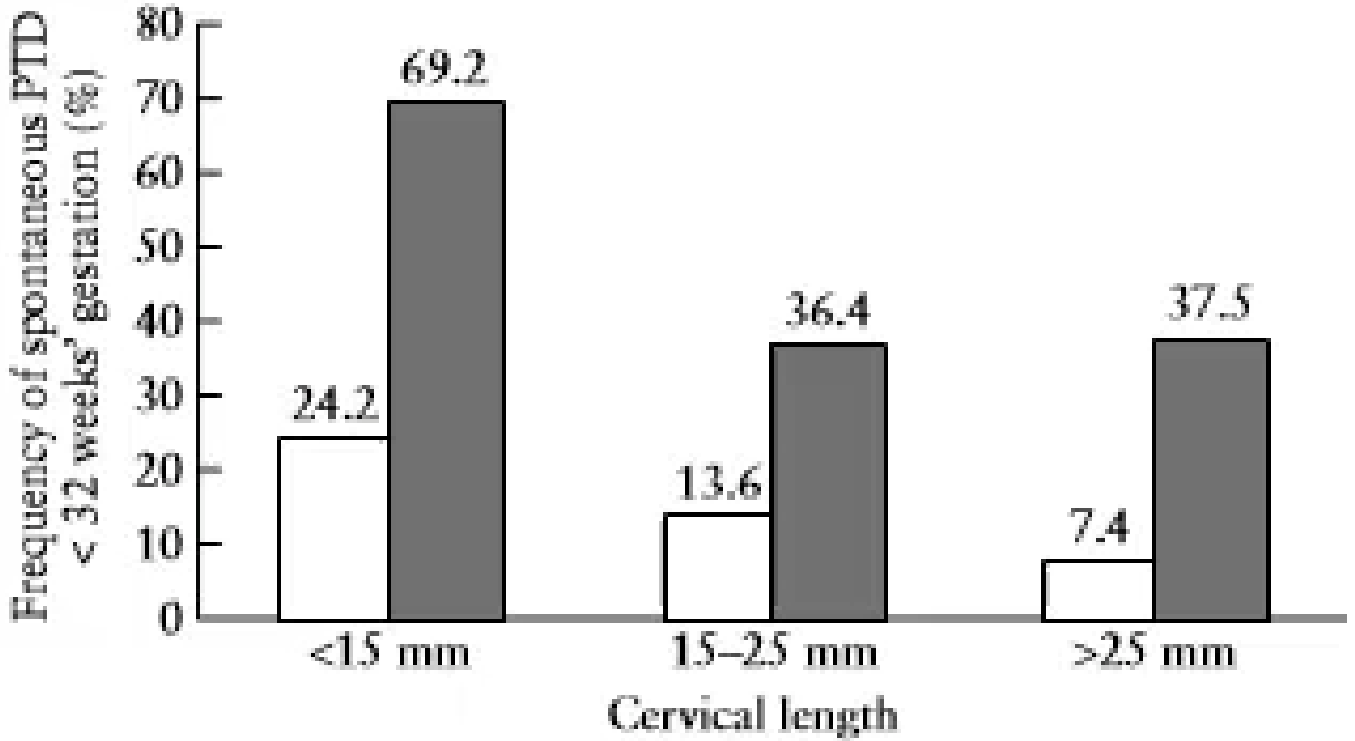


Figure 3 Frequency of spontaneous preterm delivery (PTD) at < 32 weeks of gestation according to cervical length and the presence (■) or absence (□) of amniotic fluid 'sludge'.

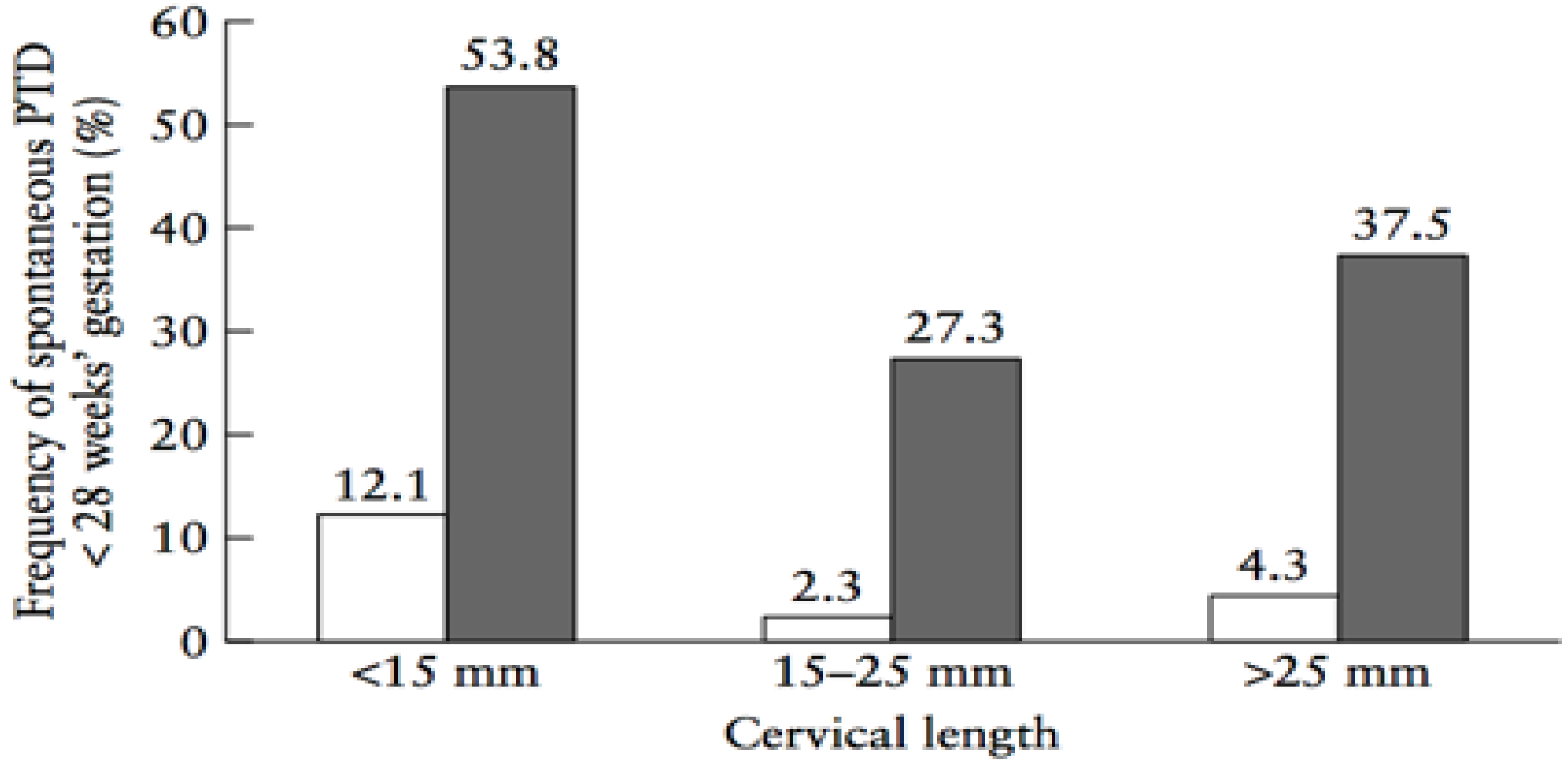


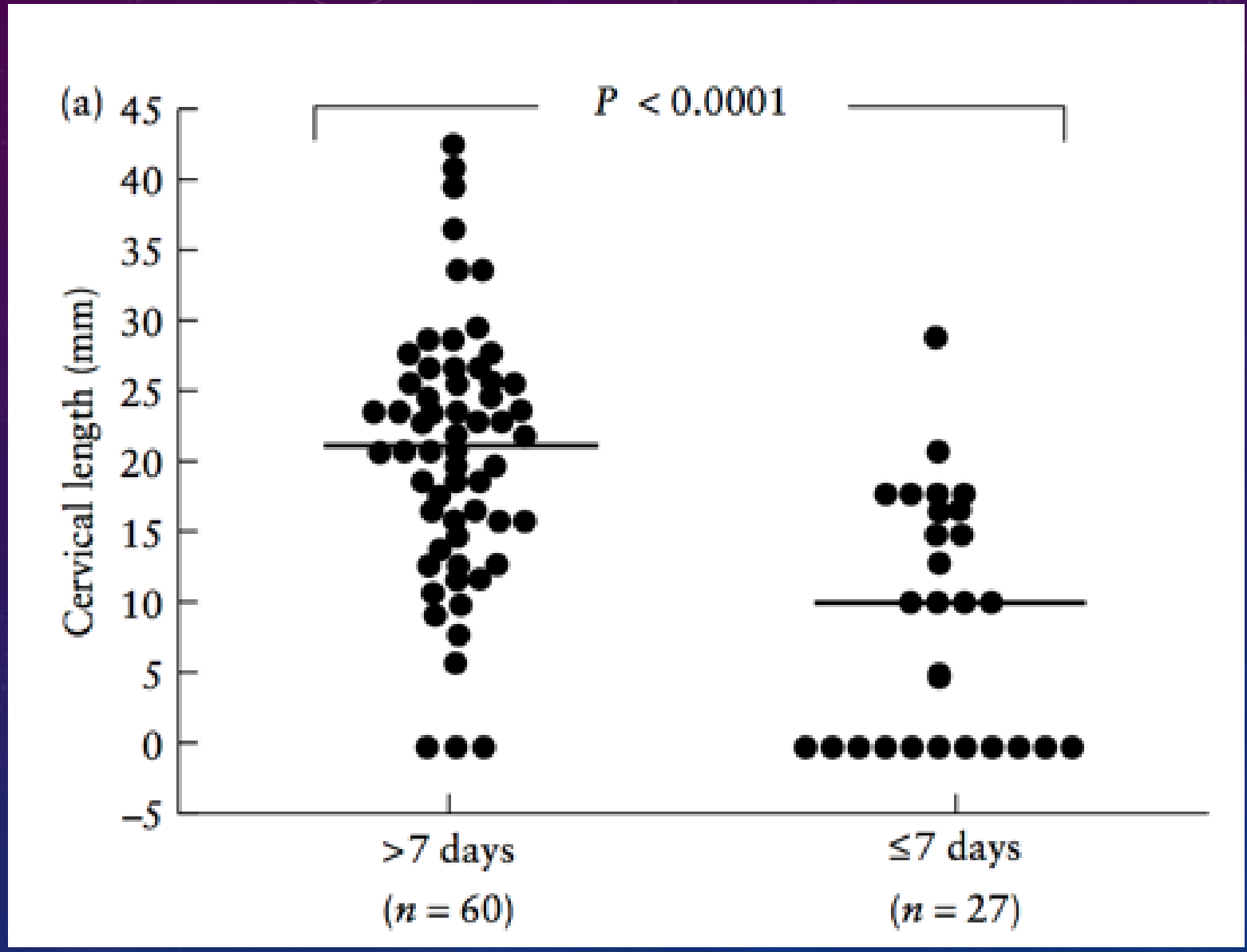
Figure 2 Frequency of spontaneous preterm delivery (PTD) at < 28 weeks of gestation according to cervical length and the presence (■) or absence (□) of amniotic fluid 'sludge'.

Table 2 Diagnostic indices for cervical length (≤ 15 mm) and levels of cervical IL-6 (≥ 1.7 ng/mL) and cervical IL-8 (≥ 6.7 ng/mL) and their ability to predict intra-amniotic inflammation

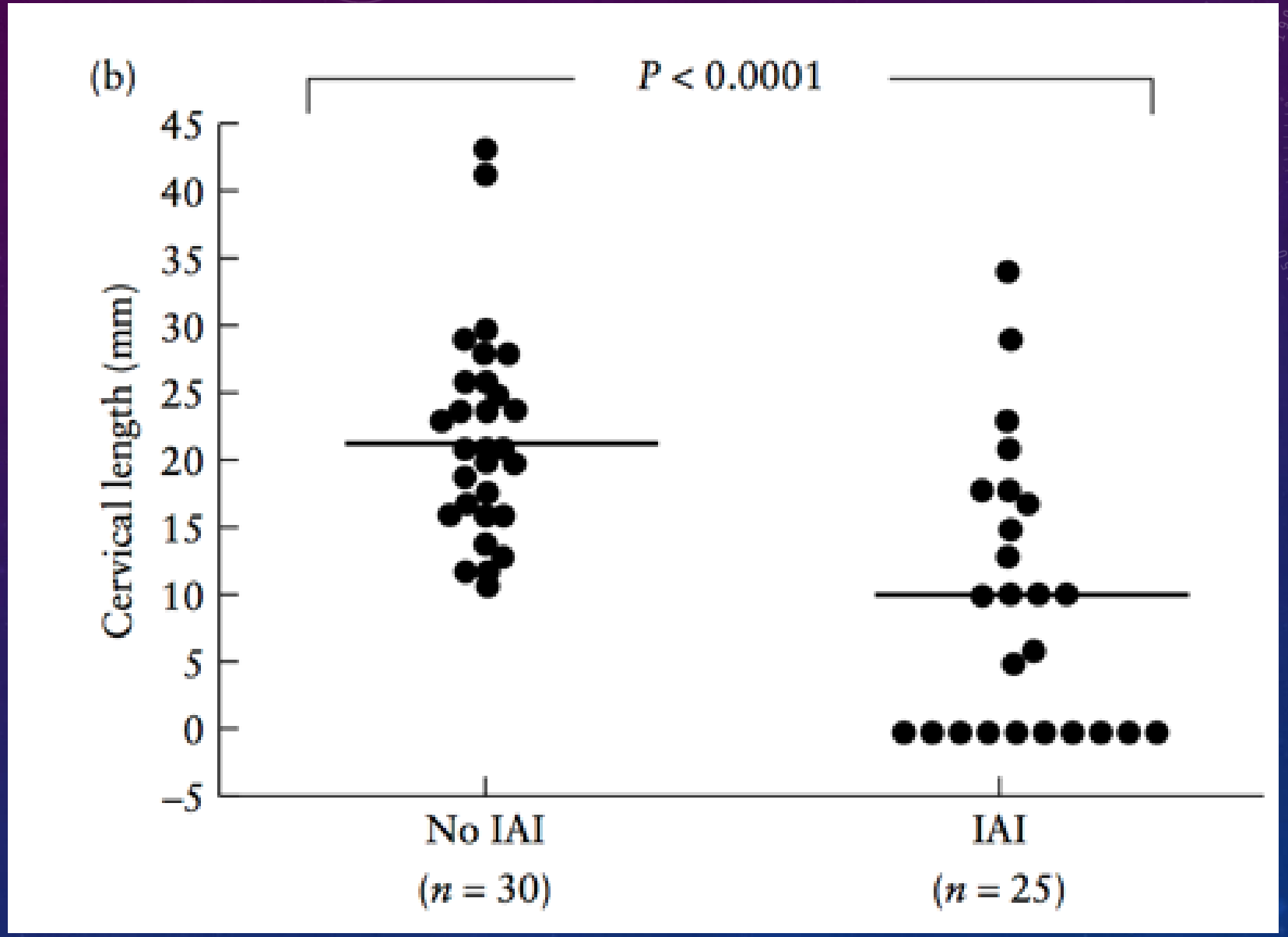
	Cervical length ≤ 15 mm	*Cervical IL-6 ≥ 1.7 ng/mL*	*Cervical IL-8 ≥ 6.7 ng/mL*
Sensitivity (% (*n*))	72 (18/25)	64 (16/25)	69 (18/26)
Specificity (% (*n*))	83 (25/30)	83 (25/30)	62 (18/29)
PPV (% (*n*))	78 (18/23)	76 (16/21)	62 (18/29)
NPV (% (*n*))	78 (25/32)	73 (25/34)	69 (18/26)
Likelihood ratio	4.3	3.8	1.8
Relative risk (95% CI)	3.6 (1.8–7.1)	2.9 (1.6–5.3)	2.0 (1.1–3.8)
P	< 0.0001	0.0006	0.031

IL, interleukin; NPV, negative predictive value; PPV, positive predictive value.

Holst , R.M et al. *Ultrasound Obstet Gynecol* 2006; **28**: 768–774



Holst , R.M et al. *Ultrasound Obstet Gynecol* 2006; **28**: 768–774


(b)
P < 0.0001
Cervical length (mm)
45
40
35
30
25
20
15
10
5
0
−5
No IAI
(n = 30)
IAI
(n = 25)

Walaupun kita menyadari pengukuran cervix – sensitifitas pada kelompok berisiko hanya sekitar 60%, dibantu dengan elastography serta melacak akan adanya kemungkinan infeksi , mengurangi kemungkinan morbiditas janin dikemudian hari.

Terima kasih