FIGO XXII • RIO WORLD CONGRESS OF GYNECOLOGY AND OBSTETRICS

Gestational age estimates at Rajasthan health centers: adequate for antenatal corticosteroid use?

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Declaration of Good Standing and Conflict of Interest Disclosure

My presentation complies with FIGO's policy for declaration of good standing and conflict of interest disclosure. I do not have a financial interest in any product or service related to my presentation.

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Learning Objectives

1. Learners will be able to describe clinical importance of gestational age (GA) estimation in antenatal care (ANC) and intrapartum (IP) care.
2. Learners will be able to outline main findings for Rajasthan from the Asia Gestational age Estimation Study (AGES).
3. Learners will be able to identify recommended strategies for improving quality of gestational age estimation in ANC and IP care settings.

Accurate and precise gestational age (GA) assessment is critically important for safe and effective clinical care of pregnant women and their newborns.

Poor GA assessment contributes to misclassification of preterm birth (PTB) and inappropriate administration of antenatal corticosteroids (ACS).

WHO recommendation on antenatal corticosteroid therapy (2015)

ACS therapy recommended for women at risk of PTB from 24-34 weeks of gestation when following conditions are met:

- GA assessment can be accurately undertaken
- PTB considered imminent
- No clinical evidence of maternal infection
- Adequate childbirth care is available (including capacity to recognize and safely manage preterm labour and birth)
- Preterm newborn can receive adequate care if needed (resuscitation, thermal care, feeding support, infection treatment, safe oxygen use)

What counts as accurate GA estimation?

- WHO recommendation largely based on evidence derived from high resource settings
- "Accurate and standardized GA assessment (ideally from first trimester ultrasound) is essential to ensure that all eligible mothers receive corticosteroids while avoiding unnecessary treatment of ineligible mothers"
  - Should not be routinely administered where GA cannot be confirmed
  - Particularly when GA suspected >34 weeks, as risk of harm may outweigh benefits if mature fetuses are exposed to corticosteroid

ACT successfully increased ACS in low resource settings, but saw increase in neonatal deaths

- Increased ACS use for women w/ infants with BW <5th %ile
  - 45% of <5th %ile births in intervention group vs. 10 % in control group received at least one dose of ACS ($p < 0.0001$)
- Of all who received ACS (intervention), 16% w/ BW <5th %ile
  - Did not significantly reduce neonatal mortality for those infants
- Increase in neonatal deaths by 3.5/1000 livebirths in intervention vs. control (infants w/BW>25th%ile)
  - Also: increase of suspected infection in women

Althabe et al, Lancet 2015.

Gestational age assessment can be challenging and complex

- Knowledge gaps common among providers
  - Strategies for estimating and modifying GA
- Presentation for ANC in first trimester is exception
- GA assessment impacted by many factors
  - Client, provider, and local context
- Few data on how GA data is documented, transmitted, and used in low-resource settings

Gomez, P., et al., Challenges in Implementing the World Health Organization's Updated Policy Recommendation on Use of Intermittent Preventive Treatment of Malaria in Pregnancy using SP, in JHU Malaria in Pregnancy Symposium 2015: Baltimore, MD.

Strategy	Advantages	Disadvantages
Naegele's rule	Inexpensive, standardized Requires limited training Accepted tools (wheel)	Subject to patient recall limitation Inaccurate and/or imprecise if recent progestin-only contraception, BF, and/or irreg. menses
Estimated date of conception	Inexpensive, standardized Useful if irregular sex Requires limited training	Subject to patient recall limitation Imprecise in the context of typical patterns for frequency of intercourse
Uterine examination	Inexpensive	equires specialized training roids, obesity, multiples,
Quickening	Inexpensive	nitation ous ntions
Infant examination	Inexpensive, standardized tools available	Precision varies by instrument Not useful for pre-delivery decision-making Requires specialized training
Ultrasound examination	Accurate/precise if correctly performed, esp. first tri.	Costly, sensitive equipment with need for power supply and specialized maintenance, specialized training, provider scope issues

Many methods available, but all have advantages and disadvantages.

Few women can access gold standard

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High-risk pregnancy experts

COMMITTEE OPINION

Number 700, May 2017 *(Replaces Committee Opinion Number 611, October 2014)*

Committee on Obstetric Practice
American Institute of Ultrasound in Medicine
Society for Maternal–Fetal Medicine

This Committee Opinion was developed by the American College of Obstetricians and Gynecologists' Committee on Obstetric Practice, in collaboration with members Christian M. Pettker, MD; James D. Goldberg, MD; and Yasser Y. El-Sayed, MD; the American Institute of Ultrasound in Medicine's liaison member Joshua A. Copel, MD; and the Society for Maternal-Fetal Medicine.

This document reflects emerging clinical and scientific advances as of the date issued and is subject to change. The information should not be construed as dictating an exclusive course of treatment or procedure to be followed.

PDF Format

Methods for Estimating the Due Date

However, some settings have considered moving ACS to lower levels of health system

Primary Aim

- To describe the practice of GA estimation and documentation at selected facility-based antenatal care (ANC) settings in India and Cambodia
  - Estimated proportion of ANC clients who have a GA assessment performed in first trimester
  - GA estimation method(s) used
  - Documentation of these methods

Secondary Aims

1. To describe the practice of GA estimation and documentation at selected intrapartum settings in India and Cambodia
2. To describe utilization of GA estimation data for patient care at selected ANC and intrapartum settings in India and Cambodia
3. To identify strategies to improve provider use of GA estimation data for clinical decision-making at selected intrapartum settings in India and Cambodia

Exploratory Aim

- In a subset of patients, to assess the accuracy of GA estimation in ANC and intrapartum settings compared to a "gold standard" clinical assessment by expert clinician(s) using clinical criteria and ultrasonography

Methods

- Cross-sectional, mixed methods study
- Direct observation of provider/client interactions
- ANC record review (cards and registers)
- Client, provider, and stakeholder interviews
- In-depth interviews with providers
- Subset: repeat examination, ultrasound

	India (Rajasthan)		
Antenatal Care	PHC	Hospital	Total
Patients	102		102
Providers/facility	1		
Patients/provider	6		
Patient-provider interactions/site	6		
Facilities/country	**17**		17
Total ANC providers	17*		17
Intrapartum Care			
Patients	102	108	210
Providers/facility	1	2	
Patients/provider	6	6	
Patient-provider interactions/site	6	12	
Facilities/country	17	**9**	26
Total IP providers	17*	18	35
Key stakeholders			10
ANC qualitative interviews			10
IP qualitative interviews			10

210 total clients
17 PHC
9 hospitals
6 client interactions/provider

Primary outcome:

- Estimated proportion of ANC clients who have a GA assessment performed and documented in first trimester
  - 7% women had documentation <14 weeks, by LMP or US
- GA estimation method(s) used
  - Providers nearly always asked women for LMP and often performed exam, but ultrasound was rare
- Documentation
  - 31% received ANC card before or during first ANC visit
  - Most consistently documented LMP, fundal height

	ANC Observations (n=102)	
	No.	%
Provider asked about LMP	94	92.2
ANC card available?		
Yes	32	31.4
No, card kept with facility	23	22.5
No card/book used	47	46.1
	n=32	
Complete LMP date recorded, among those with ANC card	32	100
Fundal height documented, among those with ANC card	18	85.7

Ultrasound uncommon for ANC clients

Ultrasound records	n=102	%
Conducted prior to 14 wks	3	2.9
Conducted 14+ wks	4	3.9
Conducted but record not available	1	1
Not conducted	94	92.2

~1/4 of first ANC visits lacked documentation of GA in ANC registers

	PHC	
Antenatal care Registers	No.	%
Number of ANC visit documented	300	61.7
Gestational age category, among first ANC visits	No.	%
<14 weeks	49	47.6
14+ weeks	28	27.2
Missing	26	25.2

GA missing in 41% of records in delivery registers

	DH		PHC		Total	
Gestational age category at birth						
<24	2	0.11	0	0	2	0.1
24-33	38	1.4	10	0.8	48	1.2
34-37	532	19.2	45	3.7	577	14.5
38-40	883	31.9	835	69	1718	43.2
>40	0	0	3	0.2	3	0.1
Missing	1312	47.4	317	26.2	1629	41.0

Strengths

- Quantitative and qualitative methods
- Data collection across multiple forms of documentation
  - ANC and intrapartum registers and client records
- Random selection of facilities

Limitations

- Cross-sectional study
- Direct observation can impact client responses and provider clinical practice
- Norms may vary
  - Across and within countries, public versus private sector
- Study not designed to evaluate local quality of ultrasound-based GA estimation

Key Points - Preliminary

- Few clients with first trimester GA estimation
- Ultrasound availability rare at HC level
- H&P practice for GA appears to be lacking
- ANC documentation frequently inadequate for use as a data source in intrapartum setting
- Intrapartum setting documentation also frequently incomplete
- Almost 40% of clients with time-sensitive interventions had no GA documentation

Future Analyses

- Qualitative data
- Client-provider interactions for GA assessment
  - Inadequate vs. adequate dates
  - Possibly latent class analysis
- Equity Tool data

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Need to address multiple health system factors

- Political will around addressing PTB
- Ensure records are available at health centers for first visits
- Improve experience and delivery of care to attract women for earlier ANC visits
- Build better skill-building into pre-service/in-service education
- Quality improvement initiatives, including those that contribute to a culture of documentation
- Rational use of ultrasound where systems can support

Key Messages

1. Gestational age assessment in lower resource settings is challenging due to many factors, yet critically important for providing quality maternal newborn care.
2. Findings suggest that many patients at PHC level have GA assessment inadequate for provision of ACS.
3. A system-wide and context-specific approach to improving gestational age assessment, documentation, and use of GA data for clinical management may contribute to improved quality of care.

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Thank you

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AGES Study Team

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For more information, please visit
www.mcsprogram.org

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Extra slides

Guidance for Changing EDD

Criteria for changing an EDD based on LMP If ultrasound data are available	
Ultrasound GA	Discrepancy between ultrasound dating and LNMP dating that supports re-dating by ultrasound
≤ 8 6/7 weeks	More than 5 d
9 0/7 to 13 6/7 weeks	More than 7 d
14 0/7 to 15 6/7 weeks	More than 7 d
16 0/7 to 21 6/7 weeks	More than 10 d
22 0/7 to 27 6/7 weeks	More than 14 d
28 0/7 weeks and beyond	More than 21 d
*Based on ACOG Committee Opinion No. 611 (ACOG/AIUM/SMFM), October 2014	

ACT

- Assessed feasibility, effectiveness, and safety of complex intervention to increase use of ACS at all levels of care
- Seven study sites (Argentina, Guatemala, Kenya, Zambia, Pakistan and India [2 sites])
- Target group: pregnancies delivering infant at a weight below site-specific 5th percentile

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RESEARCH Open Access

The Antenatal Corticosteroids Trial (ACT)'s explanations for neonatal mortality - a secondary analysis

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ACT Secondary Analysis

- ACS (vs. other components of intervention) may have been involved in increased neonatal mortality, and also in observed risks of potential severe infections reported
- No clear interpretations can be drawn about characteristics of ACS administration that could have been associated with higher risk of neonatal death

Assumptions

- Alpha of 0.05
- Two countries, 17 facilities per country
- 1 provider per HC, randomly selected if >1
- Within-provider ICC of 0.8
  - No data to estimate ρ, high ICC assumed
  - Estimated 30% of ANC clients with GA documented in first trimester
- Six ANC clients observed per provider

Characteristics

Facility Characteristics	Hospital	Primary Health Center
	n=9	n=17
Mean antenatal check-ups per month (SD)	N/A	21.2 (14.3)
Mean births per month (SD)	630.1 (128.8)	66.9 (22.9)
Percentage of facilities with ultrasound available	88.9	0

Most ANC records lacked documentation

Documentation of GA methods	n=102	%
U/S <14 wks	3	2.9
LMP doc <14 wks	4	3.9
U/S 14+ wks	4	3.9
LMP 14+ wks	23	22.5
None of the above	68	66.7

	Antenatal Care		Intrapartum Care			
Health Provider Characteristics	n=21		n=17		n=22	
	PHC		DH		PHC	
Cadre	%	No.	%	No.	%	No.
Doctor	42.9	9	64.7	11	0	0
Nurse	57.1	12	35.3	6	45.5	10
Years since qualification		No.				
0 to 5	23.8	5	29.4	5	22.7	5
6 to 12	33.3	7	17.6	3	22.7	5
13 to 25	14.3	3	17.6	3	27.3	6
>25	28.6	6	35.3	6	27.3	6

Pregnant Women's Characteristics	n=102		n=108		n=102	
	PHC		DH		PHC	
Age	%	No.	%	No.	%	No.
<19	3.9	4	0	0	0	0
19-24	57.8	59	57.4	62	52	53
25-34	38.2	39	41.7	45	45.1	46
35+	0	0	0.9	1	2.9	3
Parity						
0	41.2	42	45.4	49	31.4	32
1	27.5	28	38	41	33.3	34
2	15.7	16	13.9	15	24.5	25
3+	15.7	16	2.8	3	10.8	11

Pregnant women (cont.)	PHC (n=102)		DH (n=108)		PHC (n=102)	
Educational Category	%	No.	%	No.	%	No.
Unable to read or write	35.3	36	16.7	18	60.8	62
Informal/primary school only	13.7	14	23.1	25	19.6	20
Middle school	23.5	24	22.2	24	7.8	8
Secondary or higher	27.5	28	38	41	11.8	12
Wealth Quintiles						
Lowest	19.6	20	5.6	6	24.5	25
Second	21.6	22	10.2	11	30.4	31
Third	13.7	14	9.3	10	8.8	9
Fourth	18.6	19	22.2	24	23.5	24
Highest	26.5	27	52.8	57	12.7	13