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TERATOGENEIS

DEFINITION

The process by which congenital malformations are produced in an embryo or fetus.

VARIABLES AFFECTING TERATOGENESIS

Specificity of Agent

Some agents are more teratogenic than others.

Less obvious is the axiom that an agent may be teratogenic in only certain species. For example, thalidomide produces phocomelia in primates but not in rodents.

Dosage

At any given time, an embryo can respond to a teratogen in one of three ways:

(1) at a low dose, there is no effect

2) at an intermediate dose, a pattern of organ-specific malformations can result

(3) at a high dose, the embryo may be killed, causing the organ-specific teratogenic action to go unrecognized.

Timing

Some teratogens cause damage only during specific days of weeks in early pregnancy other teratogens are harmful at any time during the pregnancy--for example, for behavioral teratogens.

There is no safe period---the brain and nervous system can be harmed throughout the pregnancy.

Genotype

Genotype determines the prevalence of cleft palate in inbred strains of mice whose mothers are administered cortisol during pregnancy.

Drug Interactions

Simultaneous administration of two(Drugs) teratogens may produce a different effect from that existing when the two are administered separately.

SCREENING METHODS

First Trimester Screening

BIOPHYSICAL

- nuchal translucency (NT),
- Nasal bone

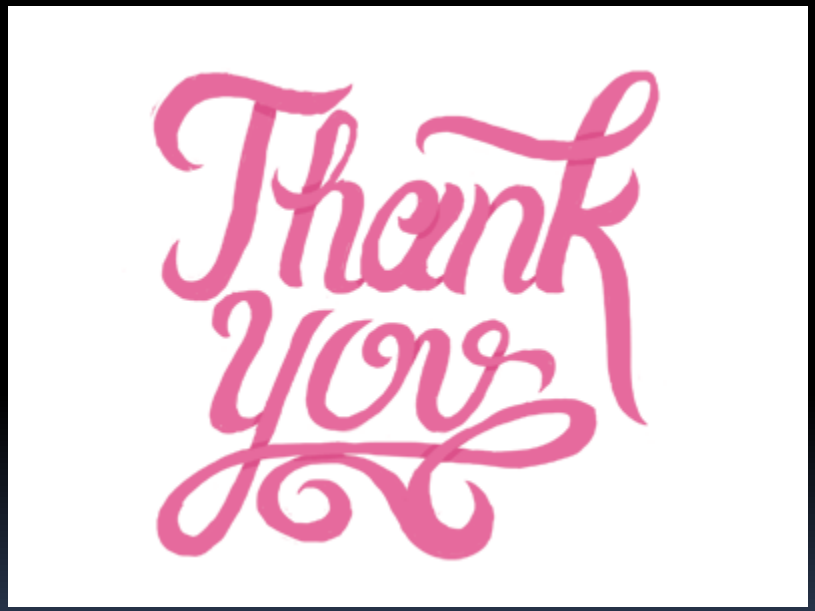
BIOCHEMICAL

- free β-hCG
- PAPP-A (Pregnancy Associated Plasma Protein-A).

Second Trimester Screening

- Quadruple (Quad) Screening includes four biochemical analytes:
- Maternal Serum Alpha Fetoprotein (MSAFP),
- Unconjugated estriol (uE3),
- dimeric inhibin-A and
- hCG.

	CHORIONIC VILLUS SAMPLING	AMNIOCENTESIS	CORDOCENTESIS
Time	Transcervical 10–13 weeks, Transabdominal 10 weeks to term	After 15 weeks (early 12–14 weeks)	18–20 weeks
Materials for study	Trophoblast cells	Fetal fibroblasts Fluid for biochemical study (see p. 741)	Fetal white blood cells (others—infection and biochemical study)
Karyotype	Direct preparation: 24–48 hours. Culture: 10–14 days	Culture: 3–4 weeks	Culture: 24–48 hours
Fetal loss	0.5–1%	0.5%	1–2%
Accuracy	Accurate; may need amniocentesis for confirmation	Highly accurate	Highly accurate
Termination of pregnancy when indicated	1st trimester—safe	2nd trimester—risky	2nd trimester–risky
Maternal effects following termination of pregnancy	Very little	More traumatic; physically and psychologically	Same as amniocentesis


Thank
you