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Physiologicaladaptationsofthefemaletopregnancy

ChangesintheendocrineSystem

Duringpregnancyawomanexperiencesachangeinherendocrinesystem.Throughout pregnancythelevelsofprogesteroneandoestrogenincrease;theoestrogenbeingproducedby theplacentaandtheprogesteronebeingproducedbythecorpusluteum andlaterbythe placenta.Increaseinoestrogenlevelsresultsinanincreaseinhepaticproductionofthyroid bindingglobulin(TBG).Asaresult,morefreeT3andT4bindtotheTBG,thiscausesmore thyroidstimulatinghormonetobereleasedfrom theanteriorpituitarygland.Therefore,thefree T3andT4levelsremainunchanged–butthetotalT3andT4levelsrise.

Thyroxinisessentialforfoetus’sneuraldevelopment,butthefoetalthyroidglandisnot functionaluntilthesecondtrimesterofgestation.Hence,increasingT3andT4levelsinthe motherensuresthatthereisaconstantsupplyofthryoxintothefoetusearlyinpregnancy.

Duringpregnancy,mainlyduringtheresecondtrimester,thereisanincreaseofhumanplacental lactogen,prolactin,cortisolevelsalongwiththeincreaseinprogesteroneandoestrogenlevels. Theseareanti-insulinhormonestherefore,theyincreaseinsulinresistanceinthemotherand reduceperipheraluptakeofglucose.Thisensuresthatthereisacontinuoussupplyofglucose forthefoetus.Themotherswitchestoanalternativesourceofenergywhichisprovidedbylipids. Theincreaseinlipolysismeansthatthereisanincreaseinfreefatyacidsintheplasmawhich providesubstrateformaternalmetabolism.Thebreakdownoflipidscanresultinketogenesis thus,pregnancyisassociatedwithanincreasedriskofketoacidosis.

ChangesinthecardiovascularSystem

Asdiscussedabove,duringpregnancyprogesteronelevelsincreases.Progesteroneactsto decreasesystemicvascularresistanceinpregnancywhichleadstoadecreaseindiastolic bloodpressureduringthefirstandsecondtrimesterofpregnancy.Inresponsetothisthe cardiacoutputincreasesbyabout30-50%.Anincreaseinbloodpressureinpregnancycouldbe anindicationofpre-eclapmsia.Pregnancyresultsintheactivationoftherenin-angiotensin system.Thisleadstoanincreaseinsodium levelsandwaterretention.Thismeansthatthe totalbloodvolumeincreases.

ChangesintherespiratorySystem Anatomicaly,thegrowthofthefoetusduringpregnancycausesupwarddisplacementofthe

 diaphragm.Thishowever,doesnotdecreasethetotalungcapacitysignificantlysincethereis alsoanincreaseinthetransverseandanterior-posteriordiametersofthethorax.Inpregnancya womanfacesanincreaseintheirmetabolicratewhichleadstoanincreaseddemandfor oxygen.Thetidalvolumeandtheminuteventilationrateincreasestohelpthemothermeetthe oxygendemands.

Manywomenexperiencehyperventilationduringpregnancy.Itisthoughtthatthereasonforthis istheincreasedcarbondioxideproductionandtheincreasedrespiratorydrivecausedby progesterone.Thishyperventilationresultsinarespiratoryalkalosiswithacompensated increaseinrenalbicarbonateexcretion.

ChangesinthegastrointestinalSystem

Thegrowthoftheuteruscausesanumberofanatomicalchangesrelatedtothegastrointestinal tract.Oneofthesewouldbetheupwarddisplacementofthestomachastheuterusgrows.This wouldleadtoanincreaseintheintra-gastricpressurewhichwouldpredisposethemotherto getingsymptomsofreflux,alongwithsymptomssuchasnauseaandvomitng.Theappendix mayalsomovetotherightupperquadrantoftheabdomenastheuterusenlarges.

Theincreaseinprogesteroneduringpregnancyresultsinsmoothmusclerelaxation.Thiswould decreasegutmotility.Althoughthisalowsformoretimefornutrientabsorption,itcanleadto constipation.Increasedprogesteronealsocausesrelaxationofthegalbladdersobiliarytract stasismayoccur.Thispredisposesthemothertogetinggalstones.

ChangesintheurinarySystem

Increasedcardiacoutputduringpregnancycausesanincreaseinrenalplasmaflowwhich increasestheGFRbyabout50-60%.Thiswouldmeanthatthereisanincreaseinrenalexcretion. Soinpregnancythelevelsofureaandcreatininewilbelower.

Progesteroneaf fectstheurinarycol lectingsystem causingrelaxationoftheureter(resultingin hydroureter).Thereisalsorelaxationofthemusclesofthebladder.Bothofthesechanges causesurinarystasiswhichpredisposesawomantoUTIs,commonlypyelonephritis.

HaematologicalChanges

Inpregnancythereisanincreaseinfibrinogenandclotingfactorsinthebloodandadecrease infibrinolysis.Additionaly,duetoanincreaseinprogesteronelevelsstasisofbloodand venodilationoccurs.Althesefactorsincreasetheriskofthromboembolicdiseaseinpregnancy. Warfarincannotbegiventopregnantwomentocounteractthisasitcancrosstheplacenta

 anditisateratogen.LowMolecularWeightHeparin(LMWH)isusualyconsideredthe anticoagulantofchoiceduringpregnancyifitisnecessarytogivethemotheranticoagulant drug.Duringpregnancytheplasmavolumeincreasessignificantly.However,theredcelmass doesnotincreasebyasmuch.Thisresultsinaphysiologicaldilutionalanemia