Alternatives to oral contraceptives
Case based discussion

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Disclosures

- Consultant: Allergan
- I have no financial relationship with any of the products discussed
- Images are either stock images readily available at google image or adopted from referenced publications
Objectives

- List common contraceptive methods and the basis of their action
- Describe method, contraindications, risks & benefits
- Describe non-contraceptive health benefits
- Discuss migraine patient-centered contraceptive decision making and counseling
Case

- A 17yo girl with migraine with aura who is monogamous with her boyfriend of 1 year confides in you that they are tired of “using condoms all the time.” She has spoken with her gynecologist who has been reluctant to prescribe COCs. She asks you if you have any recommendations regarding contraceptive options that are safe and will not exacerbate her migraine?
Contraception: Why is it Important?

6.1 Million Pregnancies in 2011

- Unintended (45%)
- Intended
- Mistimed
- Unwanted (55%)

Unintended

MOST WOMEN WITH MIGRAINE ARE OF REPRODUCTIVE AGE

AGE AND GENDER SPECIFIC PREVALENCE OF MIGRAINE

Lipton et al. Neurology 2007;68:343-349
Contraceptive Counseling

- **Patient characteristics**
  - Age
  - Type/frequency of sexual activity
  - Pregnancy intentions
  - Lifestyle
  - Adherence
  - Medical history
  - Insurance status
  - Perceptions/misperceptions about contraception

- **Method Characteristics**
  - Effectiveness
  - Cost
  - Side effects
Contraceptive Options

- Long-Acting Reversible Contraceptives
  - IUCs, implant
- Combination hormonal methods
  - Pills, patch, vaginal ring injectable
- Progestin-only methods
  - Pills, injectables
- Emergency contraception
  - Pills, Copper IUD
- Barrier methods
  - Condoms, diaphragm, cervical cap, sponge
- Female or male sterilization
- Fertility awareness
Contraception In the U.S

All percentages are significantly different from each other across age groups.
## Contraceptive actions

<table>
<thead>
<tr>
<th>Method of contraception</th>
<th>Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interference with sperm transport</td>
<td>Male and female sterilization</td>
</tr>
<tr>
<td></td>
<td>Male condoms</td>
</tr>
<tr>
<td></td>
<td>Female barriers: condoms, cervical cap, diaphragm</td>
</tr>
<tr>
<td></td>
<td>Coitus interruptus (withdrawal)</td>
</tr>
<tr>
<td>Spermicidal actions</td>
<td>Spermicidal agents</td>
</tr>
<tr>
<td></td>
<td>IUDs * (multiple methods may be involved)</td>
</tr>
<tr>
<td>Suppression of ovulation</td>
<td>Progestin-only methods</td>
</tr>
<tr>
<td></td>
<td>Progestin-only pills</td>
</tr>
<tr>
<td></td>
<td>Subdermal implant</td>
</tr>
<tr>
<td></td>
<td>IM or SQ DMPA</td>
</tr>
<tr>
<td></td>
<td>Combined estrogen-progestin</td>
</tr>
<tr>
<td></td>
<td>Combined oral contraceptives</td>
</tr>
<tr>
<td></td>
<td>Vaginal ring</td>
</tr>
<tr>
<td></td>
<td>Transdermal patch</td>
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<tr>
<td></td>
<td>Lactation</td>
</tr>
<tr>
<td>Delay of ovulation</td>
<td>Emergency contraception</td>
</tr>
<tr>
<td>Avoidance of ovulation</td>
<td>Periodic abstinence</td>
</tr>
</tbody>
</table>
## How contraceptives are used

<table>
<thead>
<tr>
<th>Method of use</th>
<th>Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoiding intercourse</td>
<td>Periodic abstinence</td>
</tr>
<tr>
<td>Altering intercourse</td>
<td>Coitus interruptus (withdrawal)</td>
</tr>
<tr>
<td>Devices related to intercourse</td>
<td>Spermicidal agents: foam, creams, jellies, sponge</td>
</tr>
<tr>
<td>Using something not related to intercourse</td>
<td>Condoms, diaphragm, cervical caps</td>
</tr>
<tr>
<td>Daily:</td>
<td>Progestin-only or combined pills</td>
</tr>
<tr>
<td>Weekly:</td>
<td>Transdermal patch</td>
</tr>
<tr>
<td>Monthly:</td>
<td>Vaginal ring</td>
</tr>
<tr>
<td>Every 3 months:</td>
<td>IM or SQ DMPA (depot medroxyprogesterone acetate)</td>
</tr>
<tr>
<td>3 years:</td>
<td>Implant</td>
</tr>
<tr>
<td>5-10 years:</td>
<td>IUD</td>
</tr>
<tr>
<td>Permanent:</td>
<td>Sterilization</td>
</tr>
<tr>
<td>Variable timing</td>
<td>Lactation, emergency contraception</td>
</tr>
</tbody>
</table>
What Works The Best?

**Effectiveness of Family Planning Methods**

- **Most Effective**
  - Implant: 0.05%
  - LNG: 0.2%
  - Copper T: 0.8%
  - Male Sterilization (Vasectomy): 0.15%
  - Female Sterilization (Abdominal, Laparoscopic, Hysteroscopic): 0.5%
  - Injectable: 6%
  - Pill: 9%
  - Patch: 9%
  - Ring: 9%
  - Diaphragm: 12%

- **Least Effective**
  - Male Condom: 18%
  - Female Condom: 21%
  - Withdrawal: 22%
  - Sponge: 24% parous women, 12% nulliparous women
  - Fertility-Awareness Based Methods: 24%

- **Injectable**
  - Injectable: Get repeat injections on time.
  - Pills: Take a pill each day.
  - Patch, Ring: Keep in place, change on time.
  - Diaphragm: Use correctly every time you have sex.

- **Condoms, sponge, withdrawal, spermicides**
  - Condoms, sponge, withdrawal, spermicides: Use correctly every time you have sex.
  - Fertility awareness-based methods: Abstain or use condoms on fertile days. Newest methods (Standard Days Method and TwoDay Method) may be the easiest to use and consequently more effective.

*The percentages indicate the number out of every 100 women who experienced an unintended pregnancy within the first year of typical use of each contraceptive method.*

**CONDONS SHOULD ALWAYS BE USED TO REDUCE THE RISK OF SEXUALLY TRANSMITTED INFECTIONS.**

**Other Methods of Contraception**
- Lactational Amenorrhea Method: LAM is a highly effective, temporary method of contraception.
- Emergency Contraception: Emergency contraceptive pills or a copper IUD after unprotected intercourse substantially reduces risk of pregnancy.

Case

A 32yo married Go with well controlled migraine previously on OCPs has had breakthrough bleeding and has decided to stop birth control for that reason. She would like to start a family in the next year, but is currently on topiramate and would like to complete her graduate degree (in the next 6 months) prior to conceiving. She is wondering about her contraceptive options at this time and potential risk of unplanned pregnancy.
Fertility Awareness-Based Methods

- Periodic abstinence
- Patients identifies potentially fertile days and abstain from intercourse or use barrier methods on those days
- Best for women with regular menstrual cycles¹
- Vaginitis or cervicitis can affect signs of fertility¹
- ~25% failure rate during first year of use²

Barrier methods

• Advantages
  – Non-hormonal
  – Often non-prescription: accessible
  – Some have decrease in sperm exposure (male and female condoms)
    • Decrease in STDs/HIV transmission among condom users

• Disadvantages
  – Related to intercourse; require partner cooperation
  – Many require spermicide for optimal effectiveness
  – Not as effective as hormonal methods
    • Failure rates as low as 5%/year with “perfect” use, but 15% or more with “typical” use

• Can add Spermicides – like Nonoxylnol-9
Long-Acting Reversible Contraception

- Contraceptive Implant
  - Approved for up to 3 years
  - Subdermal placement
  - Active agent = Etonogestrel

- Intrauterine Devices (IUDs)
  - Hormonal
    - Approved for 3 or 5 years
    - Active agent = Levonorgestrel (LNG)
  - Non-Hormonal
    - Approved for 10 years
    - Active agent = Copper Ions
### Long-Acting Reversible Contraception

<table>
<thead>
<tr>
<th></th>
<th>Copper IUD</th>
<th>LNG IUS</th>
<th>Etonogestrel Implant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bleeding profile</strong></td>
<td>Normal – heavy after placement</td>
<td>1/3 amenorrhea 1/3 irregular spotting 1/3 light, regular</td>
<td>Irregular bleeding common</td>
</tr>
<tr>
<td><strong>Non-contraceptive benefits</strong></td>
<td>-Emergency contraception -40% reduction in risk of endometrial cancer</td>
<td>-Prevention of endometrial hyperplasia -Tx menorrhagia</td>
<td>-Tx dysmenorrhea -Potential tx for PMS</td>
</tr>
<tr>
<td><strong>Side effects</strong></td>
<td>May increase bleeding profile, menstrual cramps</td>
<td>Irregular bleeding profile</td>
<td>&lt;10 lb wt gain, headaches, bleeding profile</td>
</tr>
</tbody>
</table>

Contraceptive Patch and Ring

- Transdermal patch = Ortho Evra (Xulane)
- Vaginal ring: NuvaRing
- Combined hormone delivery systems
- Typically used on 28-day cycle or continuously
- Presumed same non-contraceptive benefits
- Transdermal patch produces higher estrogen exposure; vaginal ring produces lowest exposure vs COCs
- Postmarketing surveillance found 2-fold increase in risk of non-fatal VTE with patch vs COCs

Other combined methods

- Transdermal patch
  - 4 cm square beige patch
  - Norelgestromin and ethiny estradiol (EE)
  - Used for 7 days
    - 3 consecutive patches, then 1 week off
    - 21/7 cycle
    - May be easier to remember +/-
  - No hepatic first-pass, but,
    - Nausea/vomiting rates the same as COCs
    - Estrogen levels similar to COCs
    - VTE risk the same (or possibly higher) as COCs
Pharmacokinetics

- **COC (20 microgram Oral Contraceptive Pill)**
- **Ring**
- **Patch**

Graphs showing the concentration of Ethinyl Estradiol (pg/mL) over Cycle Day for each contraceptive method.
Mode of Action of Combined Hormonal Contraception

• Circulating levels of synthetic estrogen and progestin suppresses pulsatile release of Follicle Stimulating Hormone (FSH) and Lutenizing Hormone (LH) from the pituitary which prevents ovulation.

• Other modes of action:
  – Thickening of cervical mucus (progestin dominant effect)
  – Thinning of the endometrium (progestin dominant effect)
    » Reduces the opportunity for implantation to be successful
    » Amenorrhea is safe
# WHO Medical Eligibility Criteria

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>When clinical judgment is available</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No restriction for use</td>
<td>Use the method under any circumstances</td>
</tr>
<tr>
<td>2</td>
<td>Benefits generally outweigh risks</td>
<td>Generally use the method</td>
</tr>
<tr>
<td>3</td>
<td>Risks generally outweigh benefits</td>
<td>Use of method not usually recommended, unless other methods are not available/acceptable</td>
</tr>
<tr>
<td>4</td>
<td>Unacceptable health risk</td>
<td>Method not to be used</td>
</tr>
</tbody>
</table>
### WHO Medical Eligibility Criteria for COC Use in Women with Certain Medical Conditions

<table>
<thead>
<tr>
<th>Medical Condition</th>
<th>COC WHO Risk Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking &lt; 35 yrs</td>
<td>1</td>
</tr>
<tr>
<td>Smoking ≥ 35 yrs, &lt;15/day</td>
<td>3</td>
</tr>
<tr>
<td>Smoking ≥ 35 yrs, ≥15/day</td>
<td>4</td>
</tr>
<tr>
<td>Headache (non-migrainous)</td>
<td>I/C</td>
</tr>
<tr>
<td>Migraine without aura &lt; 35 yrs</td>
<td>I/C</td>
</tr>
<tr>
<td>Migraine without aura ≥ 35 yrs</td>
<td>I/C</td>
</tr>
<tr>
<td>Migraine with aura</td>
<td>4</td>
</tr>
</tbody>
</table>

I/C (Initiation/Continuation): For example, a patient < 35 yrs with migraine without aura who wants to initiate COC would be considered as Category 1. However, if she develops migraine without aura while using COC, she would be considered as Category 3.

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Progestin Only Contraceptives

• **Mechanism of Action** ➔ “Progestin Effect”
• **Progestin Only Pill (POP)**
  – AKA: “mini pill
  – One progestin-only pill (POP) formulation currently marketed in US = Micronor
  – Norethindrone 0.35 mg
  – Low dose of progestin
  – Taken at same time daily
    • Delay of ≥3 hours requires back-up contraception for 48 hours
  – Commonly prescribed to women who are breastfeeding and recently postpartum
Progestin Only Contraceptives: Injectables

• Two formulations - SubQ and IM (DMPA)
  – Q12-14 weeks
  – >50% of women amenorrheic by 1 year
  – Fertility may be delayed after discontinuation

• Ideal candidates
  – Estrogen contraindications, breastfeeding
  – Desire low maintenance method
  – Gyn comorbidities
  – Not desiring fertility in near future
  – Sickle cell patients
  – No breast cancer
Progestin Only Contraceptives: Injectables

• Disadvantages
  – Decreased bone mineral density
    • Reverses with discontinuation
    • No evidence of increased fracture risk
  – Weight gain ≤ 5 lbs
  – Menstrual irregularities
  – Progestin related side-effects
Conclusions

- Prevalence of migraine, is very high in women of childbearing age
- Many women may encounter difficulty in obtaining COCs
- Tailor treatment to individual patient needs and specific migraine diagnosis (+/- aura)
- Various methods available in lactation, when ovulation is not fully suppressed
- Ovulatory cycles can occur even in late peri-menopause, therefore important to counsel women that they will require contraceptive options even later in life
THANK YOU!