Oral Contraceptives

Tracey L. Stierer

Uses

- Prevention of pregnancy
- Treatment of the following:
  - Dysmenorrhea
  - Menorrhagia/iron-deficiency anemia
  - Acne
  - Endometriosis
  - Functional ovarian cyst
  - Hyperandrogenism and/or polycystic ovarian disease
  - Premenstrual syndrome and/or premenstrual dysphoric disorder
  - Perimenopausal vasomotor symptoms
  - Mittelschmerz

Perioperative Risks

- Hypercoagulability; increased risk of venous and arterial thrombosis when given without concomitant aspirin, especially in women with blood type A+.

Worry About

- Thromboembolic events; increased relative risk of 2.7 (without aspirin).
- Hyperkalemia (drospirenone and/or ethinyl estradiol).
- Treatment failure and/or pregnancy. "Typical user" failure rates reported as high as 9%. Preop beta-HCG assay may be indicated in sexually active pts.

Overview/Pharmacology

- Oral preparations of synthetic estrogen, progestin generally well absorbed
- Metabolized by the liver and excreted in urine and feces

Drug Class/Mechanism of Action/Usual Dose

- Estrogens:
  - Mestrol.
  - Ethinyl.
  - Estradiol.
- Progestins:
  - Norethindrone.
  - Norgestrel.
  - Norethindrone acetate.
  - Ethynodiol diacetate.
  - Levonorgestrel.
  - Norgestimate.
  - Desogestrel.
  - Drospirenone.
  - Prometrium.
- Combination estrogen and progestin drugs inhibit ovulation by negative feedback effect on the hypothalamus; altering normal pattern of gonadotropin secretion by the anterior pituitary; cervical mucus thickens and is unfavorable to sperm even if ovulation occurs. Classified as:
  - Monophasic: Same ratio of progestin and estrogen in each pill.
  - Biphasic: Two phases of altered progestin and estrogen ratio.
  - Triphasic: Progestin and estrogen ratio varied in three phases.
- Progestin-only agents act directly by inhibiting ovulation or creating thick cervical mucus impenetrable to sperm.
- First- and second-generation progestin-only drugs pose a lower risk of thromboembolism. Third-generation progestins carry a 6- to 9-fold increase of venous thromboembolism, similar to the risk during pregnancy if given without concomitant aspirin.

Assessment Points

System	Effect	Assessment by Hx	PE	Test
CV	Htn Greatly increased risk of thromboembolic events Arrhythmia due to hyperkalemia Altered lipid/cholesterol profile	Hx of MI or CVA Hx of DVT/PE Palpitations	BP Deep venous exam	 Venous Doppler Serum K^+ Serum lipid cholesterol levels
GI	May exacerbate gallbladder disease	Hx of jaundice/cholestasis during pregnancy		Bilirubin level, US, ERCP
HEPAT	Increased incidence of hepatic adenoma and hepatocellular cancer			

Key References: Blanco-Molina A, Trujillo-Santos J, Tirado R, et al: Venous thromboembolism in women using hormonal contraceptives, *Thromb Haemost* 101(3):478–482, 2009; Chalhoub V, Edelman P, Staiti G, et al: Oral contraceptives and hormone replacement therapy: management of their thromboembolic risk in the perioperative period, *Ann Fr Anesth Reanim* 27(5):405–415, 2008.

Perioperative Implications

Preoperative Concerns

- Consider D/C of combination OCs and third-generation progestin-only OCs 1 mo prior to major surgery if administered without aspirin and adding barrier method or adding aspirin for surgery with anticipated prolonged period of immobilization.
- Must weigh OC cessation with the risk of unwanted pregnancy or termination. In addition, consider risk of anesthesia and surgery to pregnant woman and fetus, including possible teratogenicity and spontaneous abortion.

Induction/Maintenance

- Consider thromboprophylaxis on an individualized basis judged according to additional genetic and acquired risk factors.

Postoperative Period

- Surveillance for DVT and PE. Restart aspirin.
- Early mobilization; resume agents 2 wk after surgery or mobilization.

Oral Hypoglycemic Agents

Nicholas A. Levy | Ketan Dhatariya

Uses

- Oral hypoglycemic agents are used to manage type 2 diabetes mellitus.
- The term oral hypoglycemic agents is becoming obsolete and is being replaced by the term noninsulin glucose-lowering drugs because the glucagon-like peptide 1 analogues are injected.

Perioperative Risks

- Hypoglycemia (sulfonylureas and meglitinides)
- Ketoacidosis (sodium/glucose cotransporter 2 [SGLT-2] inhibitors)
- Metformin-associated lactic acidosis
- Delayed gastric emptying and potential for aspiration (glucagon-like peptide 1 [GLP 1]analogues and dipeptidyl peptidase IV [DPP-IV] inhibitors)

Overview/Pharmacology

- There are currently eight different classes of noninsulin glucose-lowering drugs that can be used to treat diabetes:
  - Sulfonylureas
  - Meglitinides
  - Intestinal alpha-glucosidase inhibitors
  - SGLT-2 inhibitors
  - Biguanides
  - Thiazolidinediones
  - GLP-1 analogues
  - The gliptins/DPP IV inhibitors

Mechanism of Action

- These drugs work via four broad mechanisms:
  - By increasing the release of endogenous insulin and causing an actual drop in blood glucose (the sulfonylureas and meglitinides)
  - By inhibiting GI absorption and renal reabsorption of glucose (intestinal alpha-glucosidase inhibitors and the SGLT-2 inhibitors)
  - By altering effector-site sensitivity to endogenous insulin and reducing gluconeogenesis/glycogenolysis or endogenous metabolism (metformin and the thiazolidinediones)
  - By acting on the incretin pathway (GLP-1 analogues and the DPP-IV inhibitors)