

## Role of progestogens in women's health: an update. Clinical relevance in present day hormonal contraception

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The contraceptive pill is an effective and very safe method to control pregnancies. It was developed 60 years ago, and despite, that the composition has been the same since it was first developed (estrogen and progestogen), along the years the concentration of ethinyl estradiol has been reduced to improve tolerability. Nevertheless, progestogens are the basic active agent of hormonal contraception. The mechanism of progestogens is a multimodal one and basically three modes of contraceptive action can be distinguished:

(a) A strong antigonadotropic action leading to the inhibition of ovulation. The necessary dosage of ovulation inhibition per day is a fixed dosage that is inherent to each progestogen and independent of the dosage of estrogen used or the partial activities of the progestogen or the mode of application. (b) Thickening of the cervical mucus to inhibit sperm penetration and (c) Desynchronization of the endometrial changes necessary for implantation.

The on the market available progestogens used for contraception are either used in combined hormonal contraceptives (in tablets, patches or vaginal rings) or as progestogen only contraceptives. Progestogen only contraceptives are available as daily oral preparations, monthly injections, implants (2–3 years), and Intrauterine Systems (IUS). Even the long acting progestogens are highly effective in typical use and have a very low risk profile.

According to their introduction into the market progestogens, in combined hormonal contraceptives, have been described as first, second, third and fourth generation progestogens. The different structures of progestogens are derivatives from testosterone, progesterone and spironolactone. These differences in the molecular structure determine pharmacodynamic and pharmacokinetic differential effects which contribute to the tolerability and additional beneficial or therapeutic effects whether used in COC or as progestogen only drugs. These differences enhance the individual options for different patient profiles. The new development of polymers for vaginal rings allowed on one side the improvement of the estrogen/progestogen combination in these rings especially in regard to the comfort of use for women (avoiding of cold chain use or packages with up to six-month rings e.g.) and on the other side the development of progestogen only formulations. Another future development will be the introduction of new progestogen on ly pills.

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