CEU Statement: Weight and contraception

April 2017

Introduction
The true impact of contraception on weight gain is difficult to establish due to multiple confounding factors. Yet many women and clinicians believe that it is a common side effect of use. This misconception can deter women from initiating particular contraceptive methods or lead to discontinuation. It is important that clinicians have a clear understanding of the relationship between contraception and weight in order to support women in choosing the most appropriate methods of contraception.

The available literature makes it difficult to determine if and how contraception can affect weight. Weight gain is rarely a primary outcome measure in studies on contraception, there is a lack of consensus on what constitutes excessive weight gain and individual women have their own opinions on what constitutes “unacceptable” weight. Furthermore, gaining weight is developmentally normal during adolescence and many adult women gain weight over time.\(^1\)

Clinicians should not only be familiar with the effects of contraception on weight, but also the effect of weight on eligibility for contraceptive use. Links between obesity and adverse health issues such as cardiovascular disease and metabolic disorders are well established\(^2\) and significant when considering certain types of contraception. When discussing contraceptive options with a woman who is overweight or obese, clinicians must relay the potential weight-related risks (e.g. venous thromboembolism, hypertension) relevant to individual contraceptive methods in addition to any theoretical risk of weight gain from method use.

Intrauterine Contraception

Contraception affecting weight
The 2015 FSRH guideline *Intrauterine Contraception* states that, “[w]eight gain has been observed with use of intrauterine contraception (IUC). There is no significant difference between hormonal and non-hormonal intrauterine methods and evidence to support a causal association is lacking.”\(^3\) Furthermore, there is no known biological mechanism for weight gain with a copper intrauterine device (Cu-IUD), suggesting that any weight gain with IUC use is likely related to confounding factors such as increasing age or lifestyle factors.\(^3\)

Review of the available literature confirms that studies examining hormonal and non-hormonal IUC have described weight gain in participants.\(^4\)\(^-\)\(^7\) A 2016 Cochrane review\(^4\) examining the effect of progestogen-only contraception on weight included four studies evaluating levonorgestrel intrauterine systems (LNG-IUS).\(^7\)\(^-\)\(^10\) These low- to moderate-quality studies compared LNG-IUS users with either Cu-IUD users or non-users. Two studies found no difference in body composition between cases and controls\(^6\)\(^,\)\(^8\); while two studies found an increase in fat mass and a decrease in lean body mass for LNG-IUS users.\(^7\)\(^,\)\(^10\) Both studies that identified differences in body weight between women using LNG-IUS or no hormonal contraception had statistically insignificant findings when determining overall weight change over a period of 12 months.\(^7\)\(^,\)\(^10\)
Weight affecting contraception

The mechanisms of action of IUC are based on local effects; therefore, a woman’s weight does not affect the contraceptive efficacy of Cu-IUDs or LNG-IUS.\textsuperscript{11-13}

In summary, there is no evidence suggesting a causal association between IUC use and weight gain or weight and IUC effectiveness.

Progestogen-only Implants

Contraception affecting weight

The 2014 FSRH guideline \textit{Progestogen-only Implants} states that while some women experience weight gain with progestogen-only implants (IMP), there is no evidence of a causal association.\textsuperscript{14}

The 2016 Cochrane review\textsuperscript{4} identified five studies evaluating women using IMP, one of which included an etonogestrel IMP, the only type currently available on the UK market (Nexplanon\textsuperscript{®}). This prospective cohort study\textsuperscript{8} examined weight change over twelve months for women using an IMP versus women using a Cu-IUD. When adjusted for age and race, the IMP was not significantly associated with weight change compared with the Cu-IUD (mean change 1.37 kg, confidence interval [CI] –0.16-2.91). The other four studies\textsuperscript{15-18} examined a levonorgestrel IMP (Norplant\textsuperscript{®}) and found no weight difference between IMP users and women using alternative contraception. Two of the studies\textsuperscript{15,18} found slight increases in body weight (0.45-1.1 kg) for Norplant users compared with non-hormonal users, but both studies were deemed very low quality and one had non-significant findings (CI 0.36-1.84).\textsuperscript{18}

A 2016 randomised control trial looking at short-term effects of a levonorgestrel IMP found no significant changes in body composition over three months between the 208 women who used the implant and the 206 women who did not. However, more women using the IMP perceived weight gain than controls.\textsuperscript{19}

Weight affecting contraception

Pharmacokinetic studies have demonstrated an inverse relationship between body weight and etonogestrel serum levels, raising concern that the IMP may be less effective in heavier women in the third year of use.\textsuperscript{14} The manufacturer of Nexplanon advises that “heavier” women may experience reduced contraceptive efficacy in the third year, however does not specify what weight range they consider “heavy.”\textsuperscript{20} The FSRH therefore advises that women are made aware of the manufacturer’s advice to replace the device early, but that there is no direct evidence that early replacement is required.\textsuperscript{14}

\textit{Progestogen-only Implants} recommends that “[n]o increased risk of pregnancy has been demonstrated in women weighing up to 149 kg. However, because of the inverse relationship between weight and serum etonogestrel levels, a reduction in the duration of contraceptive efficacy cannot be completely excluded.”\textsuperscript{14} Obesity is UKMEC category 1 for IMP use, meaning there is no restriction for use of the method.\textsuperscript{21}

In summary, there is no evidence suggesting a causal association between IMP use and weight gain. There is a theoretical potential reduction in the duration of contraceptive efficacy of IMP for women who weigh $\geq$150 kg.
Progestogen-only Injectable
Contraception affecting weight

The progestogen-only injectable, depot medroxyprogesterone acetate (DMPA), is associated with weight gain and many women discontinue the method due to this side effect.\(^2\) In the three studies of the 2016 Cochrane review\(^4\) that compared DMPA use to non-hormonal contraception, one very low quality study\(^23\) found no difference in weight gain among participants while the two low quality studies\(^9,24\) found significant weight changes. A retrospective 2010 cohort study\(^24\) determined that women using DMPA gained 3.17 kg (CI 2.51-3.83) after three years of use compared with non-users and a 2015 study\(^9\) found that DMPA users gained 6.5 kg over 10 years compared with Cu-IUD users gaining 4.9 kg.

The FSRH guideline *Progestogen-only Injectable Contraception* advises that higher initial BMI is predictive of weight gain with DMPA use in adolescents (aged <18 years) but that association has not been observed in adult women.\(^22\) It also advises that women who gain more than 5% of their baseline body weight in the first 6 months of DMPA use are likely to experience continued weight gain.

Weight affecting contraception

There is currently limited evidence regarding the effect of weight on DMPA efficacy. One study\(^25\) examining two clinical trials of subcutaneous DMPA (DMPA-SC) included women with BMIs ranging from 14.7-57.7 and recorded no pregnancies during the one-year study duration. A 26-week prospective study\(^26\) of 15 women found that DMPA levels were lower in women with BMI ≥30, especially those with BMI ≥40, although high enough to successfully suppress ovulation. In one extremely obese woman, levels dipped below the therapeutic level for the first two months of treatment and then rose.

In summary, DMPA appears to be associated with weight gain, particularly in women under 18 with a BMI ≥30. There is no evidence suggesting a causal association between weight and DMPA effectiveness, although data are limited for women with a BMI >40.

Progestogen-only Pill
Contraception affecting weight

Weight gain has been reported with POP use\(^27\) yet the evidence shows no causal association. The 2016 Cochrane review\(^4\) identified one, non-randomised study\(^10\) examining body composition changes for women using a desogestrel POP compared with women not using hormones. After one year, mean weight and BMI did not change significantly but the 42 women in the POP group gained an average of 2.8% (± 3.5%) fat mass compared with the 26 controls, who experienced no change. This low-quality study is the only evidence currently available comparing weight gain between POP users and non-users.

Weight affecting contraception

The currently available evidence has not shown reduced POP efficacy in women with higher weight and/or BMI. Manufacturers of POP do not advise increased dosages for women who are overweight or obese.\(^27\)

In summary, there is no evidence suggesting a causal association between POP use and weight gain or weight and POP effectiveness.
Combined Hormonal Contraception

Contraception affecting weight

A Cochrane review\(^{28}\) from 2014 found insufficient evidence to determine the effects of combined hormonal contraception (CHC) on weight. In the four identified trials that compared CHC use with a placebo, there were no statistically significant differences in weight or body composition between users and non-users.\(^{28}\)

The findings from these four studies are limited; one study\(^{28}\) was conducted over 40 years ago and used high-dose COC no longer in use and the remaining three studies\(^{30-32}\) used only one formulation of CHC each. The findings therefore cannot be applied to the entire range of available CHC options on the market today.

Weight affecting contraception

A 2017 systematic review\(^{33}\) of the effectiveness of hormonal contraceptives in women who were overweight or obese included fourteen studies examining COC use and two studies examining combined patch use. One pooled analysis\(^{34}\) of seven studies looking at five different CHC formulations found that women with a BMI \(\geq 30\) had a slightly increased risk of contraceptive failure than women with BMI <30 (adjusted hazard ratio 1.44; 95% CI: 1.06–1.95). The other pooled analysis\(^{35}\) in the review found no association between BMI and contraceptive failure but used a progestogen not currently used in CHC in the UK (chlormadinone acetate). The remaining studies in the review found mixed results, although any significant contraceptive failure assessed for women with higher BMI was low (odds/risk ratios 1.6-2.2).\(^{36}\) The authors noted that the evidence is limited to fair and poor quality studies.

A 2016 Cochrane review\(^{13}\) had similar findings. Two out of five COC studies found an association between BMI and pregnancy rates, although the associations were in opposite directions.

The Summary of Product Characteristics for the combined patch specifies that contraceptive efficacy may be decreased in women weighing \(\geq 90\) kg, therefore additional precautions or an alternative method should be advised.\(^{37,38}\)

In summary, there is no evidence suggesting a causal association between CHC use and weight gain or weight and CHC effectiveness. However, women weighing \(\geq 90\) kg should consider options other than the combined contraceptive patch.

Conclusion

There is currently no conclusive evidence demonstrating a causative effect of contraception on weight gain.\(^{4,26}\) There is, however, evidence that DMPA is associated with weight gain, particularly in women under 18 years with a BMI \(\geq 30\).\(^{22,24}\) There is no evidence that higher weight compromises contraceptive efficacy, with theoretical exceptions in the IMP and combined patch for women weighing \(\geq 150\) kg and \(\geq 90\) kg, respectively.

Women should be informed about what the current evidence does and does not show regarding this topic. Discussions about potential weight gain that include advice on confounding lifestyle factors could reduce contraception discontinuation due to assumptions that weight gained during treatment was definitively and solely caused by contraception. Clinicians should always refer to the UKMEC when determining whether a woman is eligible for a particular method of contraception, including women who are overweight or obese.
References


Clinical Effectiveness Unit


35. Schramm GA, Schrah G. The efficacy and safety of an oral contraceptive containing chloromadinone acetate: results of a pooled analysis of noninterventional trials in adult and adolescent women.


Acknowledgements
This guidance was developed on behalf of the CEU by Dr Janine Simpson, Specialty Trainee in Community Sexual and Reproductive Health, and Valerie Warner, CEU Researcher.

The Clinical Effectiveness Unit (CEU) was formed to support the Clinical Effectiveness Committee of the Faculty of Sexual and Reproductive Healthcare (FSRH), the largest UK professional membership organization working at the heart of sexual and reproductive healthcare. The CEU promotes evidence based clinical practice and it is fully funded by the FSRH through membership fees. It is based in Edinburgh and it provides a member’s enquiry service, evidence based guidance, new SRH product reviews and clinical audit/research. Find out more here.