# Bone mineral density in progestogen-only implant and pill users with amenorrhoea: a pilot study

Although there is good evidence that the progestogen-only injectable is associated with a decrease in bone mineral density (BMD), there is a lack of data pertaining to lower dose progestogen-only methods.[1 2] The recent guidance from the Clinical Effectiveness Unit of the Faculty of Sexual and Reproductive Healthcare advises that current evidence is too limited to confirm or exclude an association between implant use and a reduction in BMD.[3]

Amenorrhoea results from suppression of ovarian follicle growth and of oestrogen secretion.[4] It is therefore possible that amenorrhoeic women using any systemic progestogen-only contraception that suppresses ovarian activity may be more at risk of low BMD, compared with users who are continuing to experience ovarian activity and menstruation (and are less likely to be hypoestrogenic). These women may be at greater risk of BMD loss than those who experience bleeding.

In order to examine the relationship between bleeding patterns, circulating oestradiol levels and BMD among users of the implant and progestogen-only pill (POP), we designed a small pilot study. We recruited four groups: women using for a minimum of 1 year a progestogen-only implant (68 mg etonogestrel) with (1) amenorrhoea (n=22) and (2) bleeding (at least one bleed every 8 weeks) (n=22); and women using the POP (75 μg desogestrel) with (3) amenorrhoea (n=12) and (4) bleeding (n=4). We conducted a single serum oestradiol level analysis and a single dual-energy x-ray absorptiometry BMD scan.

Results are detailed in table 1. Demographically the groups were very similar, with the important exception that the median age of implant users was 28 years, in contrast to a median age of 40 for POP users. For implant users the proportion with a low BMD (T-score of <−1.0) was higher in the amenorrhoea group than the bleeding group, but results did not reach statistical significance. Small numbers recruited in the desogestrel with bleeding group made comparisons between desogestrel users difficult. Median serum oestradiol levels were generally lower in the amenorrhoea than bleeding groups, but results were not of statistical significance (potentially because of the small sample size).

Despite small numbers and recruitment challenges, our results raise the possibility that amenorrhoea in users of progestogen-only contraception (with the exception of levonorgestrel intrauterine devices) may be a marker of hypoestrogenism and possibly of low BMD, in a similar way to the injectable.[2 5] The impact of progestogen-only contraception on BMD of users is clinically important. Although our pilot study had limitations and findings were not of statistical significance, we feel that this adds support for the need for robust clinical trials to explore this further.

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**Table 1** Results of pilot study

| Contraceptive method | Bleeding pattern | N= | Numbers with low BMD (osteopenia/ osteoporosis) | Mean serum oestradiol (range): pmol/L |
|---|---|---|---|---|
| Implant | Amenorrhoea | 22 | 7 | 207(<50–1214) |
| | Bleeding | 22 | 3 | 257 (67–917) |
| POP | Amenorrhoea | 24 | 10 | 145 (<50–259) |
| | Bleeding | 4 | 4 | 406 (<50–653) |

BMD, bone mineral density.

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