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Literaturrecherche "Die Pille" und Osteoporose

Adolescence: the period of dramatic bone growth

Endocrine 2002 Feb;17(1):43-8 (ISSN: 0969-711X)

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Adolescence is a period of rapid skeletal growth during which nearly half of the adult skeletal mass is accrued. This life stage is a window of opportunity for influencing peak **bone** mass and reducing the risk of **osteoporosis** later in life. Endocrine factors that may influence peak **bone** mass include insulin-like growth factor-1, which regulates skeletal growth, and gonadotropic hormones, which stimulate epiphyseal maturation. **Estrogen** deficiency and amenorrhea can reduce skeletal mass. Weight-bearing exercise can increase **bone** mass. Appropriate mineralization of the skeleton requires adequate dietary intakes of minerals involved in the formation of hydroxyapatite; the most likely to be deficient is calcium.

freie Übersetzung (Minas - ohne Gewähr):

Die Adoleszenz ist eine Periode raschen Skelettwachstums, es wird nahezu die Hälfte der Erwachsenenknochenmasse angelegt. In diesem Lebensabschnitt kann die Spitzenknochenmasse besonders beeinflusst und das Risiko einer Osteoporose in den späteren Lebensabschnitten gesenkt werden. Die Spitzenknochenmasse wird hormonal durch Wachstumshormon und Geschlechtshormone reguliert. Östrogenmangel und Amenorrhoe können die Knochenmasse reduzieren. Sportliche Aktivität kann die Knochenmasse erhöhen. Ausreichende Mineralienzufuhr, insbesondere Kalzium ist wichtig.

Effects on bone mineral density of low-dosed oral contraceptives compared to and combined with physical activity

Contraception 1997 Feb;55(2):87-90 (ISSN: 0010-7824)

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A cross-sectional study was designed to examine the influence of exercise compared to and in combination with low-dosed oral contraceptives (OCs) on bone mineral density (BMD). One hundred twenty-eight women (20 to 35 years of age) were assigned to four groups with respect to the years of exercise and OC intake. Influence factors were determined by a detailed questionnaire and interview. BMD for L2-4 and the femoral neck was assessed by DXA. The highest BMD values were found in the group of women characterized by long-term exercise (9.45 +/- 4.32 yr) and short use of OC (1.6 +/- 1.69 yr). No beneficial effect of exercise on BMD was found in the group with a long exercise period (10.4 +/- 4.14 yr) and long-term intake of OC (8.2 +/- 4.14 yr). Differences in mean BMD values between the two groups were significant in all regions assessed ($p < 0.05$). No differences in mean BMD were found in the groups with short-term exercise but long or brief histories of OC. **The question arises as to whether active women taking low-dosed OC at an earlier age will develop an adequate BMD.**

freie Übersetzung (Minas - ohne Gewähr):

In einer Studie wurde der Einfluß von Sport in Verbindung mit **niedrig dosierten** Antikontrazeptiva auf die Knochenmasse untersucht. 128 Frauen (20 bis 35 jährige) wurden in Gruppen eingeteilt in Abhängigkeit vom Alter, sportlicher Aktivität und Einnahme von Antikontrazeptiva. Die Frauen wurden befragt und die Knochendichte an LWS und Hüfte mit DXA bestimmt. Die höchste Knochendichte hatten Frauen mit längerer sportlicher Aktivität und nur kurzer Zeitdauer der Einnahme von Antikontrazeptiva. Kein positiver Einfluß des Sport fand sich in der Gruppe mit Langzeiteinnahme von Antikontrazeptiva. Die Unterschiede des mittleren BMD waren in allen untersuchten Regionen signifikant. Kein Unterschied des durchschnittlichen BMD fand sich in der Gruppe mit kurzer sportlicher Aktivität und langer bzw. kürzerer Einnahmedauer von Antikontrazeptiva. **Es entsteht die Frage, ob Frauen, welche die low-Dose Pillen in der Jugend einnehmen eine adäquate Knochenmasse entwickeln.**

Bone metabolism markers and bone mass in healthy pubertal boys and girls

Clin Endocrinol (Oxf) 2002 Jul;57(1): 107-16
(ISSN: 0300-0664)

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OBJECTIVE: During puberty, bone growth and mineralization as well as bone turnover increase dramatically. The relation between height velocity and bone turnover is already known, but there are few studies in which both bone metabolism markers and bone mass throughout puberty have been measured. **DESIGN:** Semi-longitudinal study. In 155 healthy boys (12.0 +/- 1.5 years; range 8.8-15.7 years) and 151 healthy girls (11.2 +/- 1.6 years; range 8.2-14.0 years) markers of bone formation and bone resorption were measured as well as sex steroids, IGF-1 and IGF-BP3, together with bone mineral content (BMC) and bone mineral density (BMD) of the lumbar spine, femur and total body during puberty. All bone measurements were repeated after 1 year. **RESULTS:** BMC and BMD increased throughout puberty in both sexes. Bone turnover markers increased significantly until maximum values were reached at stage G4 in boys and stage B3 in girls. Height velocity (HV) had a similar changing pattern. Sex steroids and IGF-1 increased and reached adult values at pubertal stage 4. The correlations between bone metabolism markers and BMC were highly significant in boys, while correlations between bone metabolism markers and the increase in BMC over 1 year were significant in both sexes, as was observed for the correlations with HV. **CONCLUSIONS:** Our data suggest that bone metabolism markers are good predictors of bone mass in boys and of bone mass increase in both sexes. In early puberty, sex steroids stimulate the pubertal growth spurt in conjunction with GH and IGF-1. The fast increase in height gives rise to an increase in bone turnover and bone mineral apposition. It is known that at the end of puberty high levels of oestradiol inhibit chondrocyte proliferation. This leads to a decline in height velocity and bone turnover. Bone mass still increases under the influence of sex steroids and IGF-1. The data in our study confirm previous reports that markers of bone turnover relate positively to height velocity.

Osteoporosis and hormonal contraception

[Osteoporoz a hormonalni kontracepce.]
Ceska Gynekol 2001 Sep;66(5):309-13
(ISSN: 1210-7832)

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OBJECTIVE: To analyse the influence of the **contraceptive** treatment on **bone** mass. **DESIGN:** Literary review. **SETTING:** Department of Gynaecology and Obstetrics, 1st Faculty of Medicine, Charles University, Prague, Czech Republic. **METHOD:** Informations were collected from full-texts which were taken from database Medline. **RESULTS AND CONCLUSION:** The lowering of bone turnover under **combined oral contraception** was shown in all studies. It is favourable for **bone mineral density** after 30 years when **bone** loss starts. The positive influence is significantly dependent on the length of treatment. Only gestagen drugs have no positive effect on bone mass.

The influence of contraception on mineral density in term of physiological bone density increasing before 20-25 year is not clear. Some of studies informed us about adverse effects of extremely-low dose oral contraception on mineral density in this group.

Oral contraceptive treatment inhibits the normal acquisition of bone mineral in skeletally immature young adult female monkeys

Osteoporos Int 1997;7(4):348-53 (ISSN: 0937-941X)

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The purpose of the present study was to determine the effects of **oral contraceptive** therapy on **bone density** and serum markers of **bone** metabolism in a prospective, longitudinal study of young adult female cynomolgus monkeys. Two hundred and seven intact cynomolgus monkeys were randomized to two groups, and fed an atherogenic diet containing either no drug (Control) or a triphasic **oral contraceptive** regimen (**Contraceptive**). Measurements of **bone density** were carried out by dual-energy X-ray absorptiometry at 10-month intervals (0, 10, and 20 months) and serum **bone** biomarkers were determined at 5-month intervals over the 20-month time course. No significant differences in these variables were observed prior to treatment. Both groups of animals gained **bone mineral** during the study, indicating that peak **bone** mass had not been reached at baseline. **Contraceptive-treated** animals gained less spinal (lumbar vertebrae 2-4) **bone mineral** content and **density** and less whole-body **bone mineral** content than Controls over the course of the study. Significant depressive effects of **contraceptive** treatment on gains in BMC and BMD were observed during each 10-month interval of the study. **Bone** metabolism was inhibited in the **Contraceptive** group, as reflected by marked reductions (approximately 40%) in serum osteocalcin and alkaline phosphatase levels along with

moderate reductions in serum acid phosphatase and calcium. The results suggest that triphasic **oral contraceptive** treatment of young adult female monkeys that have not reached peak **bone** mass inhibits net **bone** accretion and/or growth by **reducing bone metabolism**. **Thus, prolonged continuous oral contraceptive use in skeletally immature females may lead to a lower peak bone mass—an effect which could increase the risk of fractures in later life.**

The emerging use of the 20-microg oral contraceptive

Fertil Steril 2001 Mar;75(3):457-65 (ISSN: 0015-0282)

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OBJECTIVE: To highlight studies that investigated the efficacy, safety, and tolerability of **low-dose oral contraceptives** (OCs) containing 20 microg of **ethinyl estradiol** (EE) and to discuss the use of these **low-dose contraceptives** in women from **adolescence** to menopause and the noncontraceptive health benefits likely to be afforded by **low-dose contraceptives**. DESIGN: Relevant literature was identified by searching MEDLINE and EMBASE. Other sources were located by consulting the bibliographies of the material collected from Medline and EMBASE. Sources for additional information **included** documents from the United States Food and Drug Administration and the Physicians' Desk Reference (54th ed.). CONCLUSION(S): The current lowest available **dose** of EE used for OCs in the United States is 20 microg. Formulations with 20 microg of EE are efficacious and have a low incidence of estrogen-related side effects. **Since this lowest effective EE dose inhibits ovarian activity (!!),** 20 microg of EE should also provide the noncontraceptive health benefits of OCs. Both **contraceptive** and

noncontraceptive benefits of OCs are available to most women from **adolescence** to menopause without complications.

Anmerkung (Minas): Es fehlen die natürlichen Oestrogenspiegel für den Aufbau der Spitzenknochenmasse!! Bei Mädchen mit niedriger peak bone mass sollte man niedrig dosierte Pillen nicht einsetzen!

Bone loss in adolescents using Depo-Provera

J Soc Pediatr Nurs 2001 Jan-Mar;6(1):21-31

(ISSN: 1088-145X)

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ISSUES AND PURPOSE: **Contraceptive** methods that decrease **bone** density in a population already deficient in calcium are a rising concern in women's health. **CONCLUSIONS: Use of Depo-Provera (DMPA) significantly decreases bone mass density (BMD) in normal adolescents up to the age of 21.** DMPA is often used in **adolescents** with disabilities who may already be at high risk for **osteoporosis**. The effects are likely to be similar to that in able-bodied **adolescents**, but research is limited. PRACTICE IMPLICATIONS: Through early identification of risk factors in able-bodied and disabled **adolescents**, primary care providers considering the use of DMPA in **adolescents** can optimize BMD by providing adequate nutritional assessment, counseling on nutritional sources of calcium, calcium supplementation, guidance on exercise, and alcohol and smoking prevention or cessation.

Anmerkung (Minas): Mit der Pille sollte man bei Adolescenten vorsichtiger umgehen !!!