

Impact of Metabolic syndrome and Body Composition on Bone Mineral Density in HIV-infected individuals in Hong Kong (MSS 260)

Executive summary

Aims and Objectives

This study aims to evaluate whether metabolic syndrome and body composition correlate with osteoporosis and osteopenia in HIV-infected individuals in Hong Kong

Project design

This is a prospective observational cohort study. Adult HIV-infected individuals were recruited from the Prince of Wales Hospital and the Princess Margaret Hospital. Assessment including waist circumference, blood pressure, and HDL-cholesterol, triglyceride and glucose at fasting state were performed to determine the presence of metabolic syndrome. Dual-Energy X-Ray Absorptiometry (DEXA) scans were performed for measurement of bone mineral density (BMD) and body composition.

Target population

Two hundred HIV-infected adults with and without metabolic syndrome.

Main achievements

Two hundred HIV-infected individuals participated in this study, of which 164 (82.0%) were male, mean \pm standard deviation (SD) age was 55.7 ± 10.7 years, and 185 (92.5%) were Chinese. 88 (44.4%) were ever-smokers. The participants had HIV diagnosed for a median (interquartile range [IQR]) of 6 (11-17) years. Their current CD4 count was 532 (IQR 364-731) cells/mm³. All participants were receiving anti-retroviral therapy, and 188 (96.9%) had HIV viral load less than 50 copies/mL.

Ninety-three (46.5%) participants were diagnosed to have metabolic syndrome. Those with metabolic syndrome were older, more commonly being male, had longer duration of diagnosis of HIV, and higher current CD4 count.

Seventy-four (40.0%) participants had low BMD at the neck of femur. Participants who had low BMD at the neck of femur were older, more commonly being female, and had lower body weight, body mass index, and diastolic blood pressure.

On multivariable logistic regression model, metabolic syndrome was associated with a higher risk of low BMD at the neck of femur (adjusted odds ratio [aOR] 2.59, 95% confidence interval [95% CI] 1.04-6.46), after adjusting for age, sex, duration of diagnosis of HIV, current CD4 count and body weight. Older age (aOR 1.07, 95% CI 1.02-1.11) and lower body weight (aOR 0.94, 95% CI 0.90-0.98) were also associated with low BMD at neck of femur. In a second model

evaluating the five components of metabolic syndrome, central obesity (aOR 3.20, 95% CI 1.15-8.96) was independently associated with low BMD at neck of femur.

Low BMD at the lumbar spine was observed in 62 (33.7%) participants. Metabolic syndrome was not associated with BMD at the lumbar spine.

Low BMD at the neck of femur was associated with higher percentage of total body fat (28.7 ± 6.6 vs. 26.0 ± 6.6 , $p=0.006$) and trunk fat (29.9 ± 7.2 vs. 27.4 ± 7.2 , $p=0.019$). Such correlations were maintained after adjustment for age, sex and body weight. Similar correlations between percentage of total body fat and trunk fat and low BMD at the lumbar spine were also observed.

Conclusion

Metabolic syndrome, in particular central obesity, is an independent risk factor for low bone mineral density at the neck of femur in Chinese HIV-infected individuals on anti-retroviral therapy. HIV-infected individuals with metabolic syndrome or central obesity should be screened for osteopenia and osteoporosis.

代謝綜合症和身體成分對香港愛滋病病人骨質密度之影響

目標乃宗旨

我們希望透過這項研究可以知道，在香港愛滋病病人當中，代謝綜合症與身體成分(包括脂肪及身體淨重)和骨質密度之間的關係。

研究設計

這是一項前瞻性世代研究。於威爾斯親王醫院及瑪嘉烈醫院覆診的成人愛滋病患者被邀請參與這項研究。他們接受的檢查包括量度腰圍和血壓，以及於空腹狀態下抽取血液樣本以量度膽固醇、血脂以及血糖，以析別他們是否患上代謝綜合症。他們也進行雙能量 X 光測試以量度骨質密度及體內脂肪含量。

服務對象

二百位患上愛滋病的成人

所得的成果

二百位患上愛滋病的成人參與了這項研究計劃。他們當 164 人(82%)為男性，平均年齡為 55.7 歲，185 人(92.5%)為中國籍。88 人(44.4%)曾吸煙。參與者被確診愛滋病已有 6 年(四分位數範圍 11-17 年)。他們現時的 CD4 指數為 532(四分位數範圍 364-731) cells/mm³。所有參與者均正服用抗病毒藥，當中 188 人(96.9%)的愛滋病病毒數量少於 50 copies/mL。

九十三 (46.5%)位參與者被診斷患有代謝綜合症。患有代謝綜合症之參與者年齡較長，男性居多，患有愛滋病的年期較長，CD4 指數也較高。

七十四(40.0%)位參與者於股骨頸有骨質密度偏低的情況。股骨頸有骨質密度偏低的參與者年齡較長，女性居多，有較輕的體重、較低的體重指數和較低的舒張血壓。

於多變量分析中，在調整了年齡、性別、患上愛滋病的年期、現時的 CD4 指數以及體重後，代謝綜合症患者有較大機會於股骨頸有骨質密度偏低的情況(比值比為 2.59)。較大的年紀及較低的體重也增加於股骨頸患有骨質密度偏低的情況。於另一個分析代謝綜合症中的各個原素之多變量分析中，中央肥胖患者(比值比為 3.20)有較大機會於股骨頸有骨質密度偏低的情況。

六十二(33.7%)位參與者於腰椎有骨質密度偏低的情況。代謝綜合症與腰椎骨質密度沒有聯繫。

於股骨頸有骨質密度偏低的患者於全身及軀幹都有較多的脂肪含量。這個聯繫於調整了年齡、性別和體重後仍然存在。於腰椎有骨質密度偏低的患者也是於全身及軀幹都有較多的脂肪含量。

總結

在中國籍正服用抗病毒藥的愛滋病患者中，代謝綜合症，特別是中央肥胖，是於股骨頸有骨質密度偏低的高風險因素之一。患有代謝綜合症或中央肥胖的愛滋病患者應進行骨質密度的檢查。