should divide the subjects into two groups, older than and younger than 50 years of age, and use T- or Z-scores in the different age groups, respectively. In addition, the authors should not use "osteopenia" or "osteoporosis" to define subjects <50 years old.

Moreover, fracture is the most serious consequence of osteoporosis. BMD might be used to predict fractures but the sensitivity is very low. To better understand the effect of OSA on bone health, fracture rate might be a more useful marker. A previous study showed that hypoxia during sleep might be a risk predictive factor for falls and fractures in elderly men [3]. The result of Liguori *et al.* [1] suggests that OSA might be a risk factor for predicting fractures, in addition to low BMD. However, this hypothesis should be confirmed using a clinical study.

@ERSpublications
To better understand the effect of OSA on bone health, fracture rate might be a more useful marker than BMD http://ow.ly/h2vv3018gIg

Jia-Yu Zhong and Ling-Qing Yuan
Institute of Metabolism and Endocrinology, The Second Xiangya Hospital, Central South University, Changsha, China.

Correspondence: Ling-Qing Yuan, Institute of Metabolism and Endocrinology, The Second Xiangya Hospital, Central South University, 139 Middle Renmin Road, Changsha, Hunan 410011, China. E-mail: allenylq@hotmail.com

Received: June 20 2016 | Accepted: June 21 2016

Support statement: This work was supported by funding from the National Basic Research Program Programme of China (2014CB942903) and the National Natural Science Foundation of China (81270962). Funding information for this article has been deposited with the Open Funder Registry.

Conflict of interest: Disclosures can be found alongside this article at erj.ersjournals.com

References

1 Liguori C, Mercuri NB, Izzi F, *et al.* Obstructive sleep apnoea as a risk factor for osteopenia and osteoporosis in the male population. *Eur Respir J* 2016; 47: 987–990.
2 International Society for Clinical Densitometry. 2015 ISCD Official positions – Adult. www.iscd.org/official-positions/2015-iscd-official-positions-adult/ Date last accessed: October 21, 2015.
3 Cauley JA, Blackwell TL, Redline S, *et al.* Hypoxia during sleep and the risk of falls and fractures in older men: the Osteoporotic Fractures in Men sleep study. *J Am Geriatr Soc* 2014; 62: 1853–1859.

Eur Respir J 2016; 48: 1248–1249 | DOI: 10.1183/13993003.00870-2016 | Copyright ©ERS 2016

From the authors:

We thank J-Y. Zhong and L-Q. Yuan for their comments on our paper investigating bone mineral density (BMD) in male obstructive sleep apnoea (OSA) patients [1]. In our report, published in the *European Respiratory Journal* [1], we documented that male patients with severe OSA (apnoea–hypopnoea index >30 events·h^{-1}) show a severely decreased BMD in the lumbar spine and femur compared with male controls matched for age, body mass index and physical activity. We also documented that OSA patients present an increased risk for osteopenia and osteoporosis. In keeping with our findings, Chi-squared analysis corrected for continuity showed that T-scores consistent with osteopenia/osteoporosis were more frequent in OSA patients compared with controls at all regions of the lumbar spine and at the femur neck, upper femur neck and Ward triangle [1].

In agreement with the recent consensus from the International Society for Clinical Densitometry (ISCD) [2], in their correspondence Zhong and Yuan suggested that Z-score should be used when research about BMD is performed in males younger than 50 years of age. Although we agree with their suggestions, we doubt that there is actually an agreement about the definition of osteopenia/osteoporosis in heterogeneous populations of patients ranging from young-adults to the elderly. Accordingly, since we included subjects ranging from age 30 to 78 years in our study in order to consecutively evaluate patients affected by severe OSA referred to our Sleep Medicine Centre, we used T-scores for defining osteopenia and osteoporosis taking our cue from previous studies evaluating dual-energy X-ray absorptiometry measurement of BMD in the lumbar spine and femur in groups of men patients ranging from young to older ages [3, 4]. Although the official positions of the ISCD highlighted that the use of Z-scores, not T-scores, are preferred in males younger than 50 years of age, especially in children, these criteria are clinically useful at an individual level, but do not define the direction for researchers investigating large groups of patients of all ages. However, in keeping with the proposition by Zhong and Yuan, we are performing a further investigation of BMD in young-adult male

OSA patients, where we will use Z-score to define if BMD is "below the expected range for age" [2]. In fact, the ISCD proposed not to use the terms osteopenia and osteoporosis in this young population, although BMD could be severely decreased in young OSA patients, as experienced in our previous study [1].

Moreover, Zhong and Yuan also suggest quantifying the fracture risk in OSA patients, since fractures are the most serious consequence of osteoporosis. Although they propose a clinic study evaluating this issue, we suppose that this study could be troublesome to complete since OSA is treatable using continuous positive airway pressure (CPAP) therapy, which could totally restore sleep bringing it back to physiological conditions.

Therefore, although the suggestions from Zhong and Yuan are interesting, they are not applicable to our study since there is no agreement about using Z-score or T-score in large group of patients ranging from young to elderly ages. Furthermore, considering that OSA is easily treated using CPAP, fracture risk could be challenging to assess in this population.

In conclusion, taking into account that bone health could be considerably affected by sleep apnoea, future studies are needed to better score the risk for osteopenia and osteoporosis, low BMD and fracture risk at all ages in patients affected by OSA.

@ERSpublications
Obstructive sleep apnoea represents a risk factor for osteopenia and osteoporosis in male patients at all ages http://ow.ly/c9Tn302PPKz

Claudio Liguori[1], Eleonora Piccirilli[2], Francesca Izzi[1], Nicola Biagio Mercuri[1,3,4], Umberto Tarantino[2] and Fabio Placidi[1]
[1]Sleep Medicine Centre, Neurophysiopathology Unit, Dept of Systems Medicine, University of Rome "Tor Vergata", Rome, Italy. [2]Dept of Orthopedics and Traumatology, University of Rome "Tor Vergata", Rome, Italy. [3]Fondazione Santa Lucia IRCCS, Rome, Italy. [4]Neurology Unit, Dept of Systems Medicine, University of Rome "Tor Vergata", Rome, Italy.

Correspondence: Claudio Liguori, Sleep Medicine Centre, Neurophysiopathology Unit, Dept of Systems Medicine, University of Rome "Tor Vergata", Viale Oxford 81 00133 Rome, Italy. E-mail: dott.claudioliguori@yahoo.it

Received: June 20 2016 | Accepted: June 21 2016

Conflict of interest: None declared.

References

1 Liguori C, Mercuri NB, Izzi F, *et al.* Obstructive sleep apnoea as a risk factor for osteopenia and osteoporosis in the male population. *Eur Respir J* 2016; 47: 987–990.
2 International Society for Clinical Densitometry. 2015 ISCD Official Positions – adult. www.iscd.org/official-positions/2015-iscd-official-positions-adult/ Date last accessed: June 16, 2016. Date last updated: June 18, 2015.
3 Nguyen HT, von Schoultz B, Nguyen TV, *et al.* Sex hormone levels as determinants of bone mineral density and osteoporosis in Vietnamese women and men. *J Bone Miner Metab* 2015; 33: 658–665.
4 van den Bergh JP, Hermus AR, Spruyt AI, *et al.* Bone mineral density and quantitative ultrasound parameters in patients with Klinefelter's syndrome after long-term testosterone substitution. *Osteoporos Int* 2001; 12: 55–62.

Eur Respir J 2016; 48: 1249–1250 | DOI: 10.1183/13993003.01219-2016 | Copyright ©ERS 2016

Pulmonary mucosa-associated lymphoid tissue lymphoma revisited

To the Editor:

We read with great interest the review of Borie *et al.* [1] on pulmonary lymphoma of the mucosa-associated lymphoid tissue (MALT). We agree with the hypothesis that chronic antigen stimulation of microbial origin may lead to the development of pulmonary MALT lymphoma. Indeed, MALT lymphoma has been associated with various chronic infections in extrapulmonary localisations. This link has previously been demonstrated between *Helicobacter pylori* infection and gastric MALT lymphoma, and suggested with *Campylobacter jejuni*, *Chlamydia psittaci* and *Borrelia burgdorferi* with small intestine lymphoma, ocular annexa lymphoma and cutaneous lymphoma, respectively. Similarly a link has recently been suggested between infection with *Achromobacter xylosoxidans* and pulmonary MALT lymphoma [2].

Only a minority of pathogens have the ability to persist in the lung for a long period of time. Our group has investigated a link between pulmonary MALT lymphoma and mycobacterial infection for three