Annual European Congress of Rheumatology (EULAR) 2017

Madrid, Spain, 14-17 June 2017

POSTMENOPAUSAL WOMEN AT RISK OF FRACTURES COULD BE IDENTIFIED THROUGH GENETIC PROFILING

Genetic markers could guide future treatment decisions

Madrid, Spain, 16 June 2017: The results of a study presented today at the Annual European Congress of Rheumatology (EULAR) 2017 press conference showed for the first time that genetic markers, identified in previous research as being linked to the development of osteoporosis, are also associated with the risk of fragility fractures in postmenopausal women.[1]

Using these genetic markers, known as single-nucleotide polymorphisms (SNPs), it was possible to develop a genetic risk score that was significantly and consistently associated with the subsequent development of a fragility fracture.[1]

This newly developed genetic risk score proved as effective at predicting the risk of a fragility fracture as a conventional method of calculating risk known as FRAX* without a measurement of bone mineral density (BMD). Used in combination with FRAX, the genetic risk score was even more reliable at predicting the future risk of a fracture in postmenopausal women.[1]

There is now a large body of information about the genetic basis of osteoporosis.[2,3] "Our challenge was to develop a DNA-genotyping tool that could be used clinically to more accurately predict those postmenopausal women at greater risk of a fragility fracture," said lead author Professor Serge Ferrari, from the University Hospital, Geneva, Switzerland.

* The Fracture Risk Assessment Tool, developed by the World Health Organization task force in association with the University of Sheffield, uses non-Bone Mineral Density (BMD) clinical risk factors in the assessment of a patient's fracture risk to provide general clinical guidance for treatment decisions. Risk can be calculated with or without knowledge of BMD; when BMD is entered, FRAX uses the BMD of the femoral neck, in addition to the other validated clinical risk factors, to estimate risk and probability of fracture in the next 10 years in untreated patients ages 40 to 90 years of age

"Our results provide proof-of-principle that a genetic risk score based on selected SNPs represents an independent risk factor for fractures and could be used to improve the prediction of future fracture risk, either alone or together with FRAX. This newly developed tool could provide valuable guidance for future treatment decisions," Professor Ferrari concluded.

Postmenopausal osteoporosis is considered a serious public health concern due to its high prevalence worldwide. At least 30% of all postmenopausal women have osteoporosis in Europe and the US; and as many as 50% of all postmenopausal women will go on to sustain one or more fragility fractures in their lifetime.[4]

Osteoporosis and its consequence of fragility fracture impose a considerable demand on healthcare services because fracture is associated with a series of adverse events, including re-fracture and mortality.[5] One of the major priorities in osteoporosis care is the development of predictive models to identify individuals at high risk of fracture for early intervention and management. Existing predictive models include clinical factors and body measurements, in addition to BMD, but have not considered genetic variants in the prediction.[5]

The genetic marker study was carried out in a population of 1,649 postmenopausal women with osteoporotic fractures recruited in cohorts from three European countries: Switzerland, Italy and France. From a total of 768 SNPs previously associated with the development of osteoporosis, those SNPs shown to be significantly associated with clinical fragility fractures were then combined into a genetic risk score. The ability of this genetic risk score to predict fragility fractures was then evaluated.

Twenty five percent of subjects in the three cohorts had a clinical fragility fracture, (range 22 to 28%), of which half were incident major fractures. After quality control filtering, 632 SNPs in 1,625 individuals were correctly genotyped, of which 73 were potentially associated with fractures in one or more cohorts. In single and multiple regression models, the genetic risk score was significantly associated with fractures, independently of age and BMD ($p<0.0001$). The genetic risk score predicted incident major fractures as well as clinical FRAX without the use of BMD measurements ($p=0.08$), and when combined with clinical FRAX, the predictive strength was further improved ($p=0.0106$).

Abstract Number: OP0294

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NOTES TO EDITORS:

For further information on this study, or to request an interview with the study lead, please do not hesitate to contact the EULAR congress Press Office in the Goya Room at the IFEMA, Madrid during EULAR 2017 or on:

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About Rheumatic and Musculoskeletal Diseases

Rheumatic and musculoskeletal diseases (RMDs) are a diverse group of diseases that commonly affect the joints, but can also affect the muscles, other tissues and internal organs. There are more than 200 different RMDs, affecting both children and adults. They are usually caused by problems of the immune system, inflammation, infections or gradual deterioration of joints, muscle and bones. Many of these diseases are long term and worsen over time. They are typically painful and limit function. In severe cases, RMDs can result in significant disability, having a major impact on both quality of life and life expectancy.

About 'Don't Delay, Connect Today!'

'Don't Delay, Connect Today!' is a EULAR initiative that unites the voices of its three pillars, patient (PARE) organisations, scientific member societies and health professional associations - as well as its international network - with the goal of highlighting the importance of early diagnosis and access to treatment. In Europe alone, over 120 million people are currently living with a rheumatic disease (RMD), with many cases undetected. The 'Don't Delay, Connect Today' campaign aims to highlight that early diagnosis of RMDs and access to treatment can prevent further damage, and also reduce the burden on individual life and society as a whole.

About EULAR

The European League Against Rheumatism (EULAR) is an umbrella organisation which represents scientific societies, health professional associations and organisations for people with rheumatic and musculoskeletal diseases throughout Europe. EULAR aims to reduce the burden of rheumatic and musculoskeletal diseases on individuals and society and to improve the treatment, prevention and rehabilitation of rheumatic and musculoskeletal diseases. To this end, EULAR fosters excellence in education and research in the field of rheumatology. It promotes the translation of research advances into daily care and fights for the recognition of the needs of people with musculoskeletal diseases by the governing bodies in Europe through advocacy action.

To find out more about the activities of EULAR, visit: www.eular.org

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