

Transcript

Speaker 1

Welcome to the Ageing Conversation, a series of podcasts from the Oxford Institute of Population Ageing at the University of Oxford. I am Professor George Leeson, Senior Professorial Fellow at the Institute. The Oxford Institute of Population Ageing is now celebrating nearly 30 years. was the first institute to move away from looking at old age per se and instead to examine the implications for societies, economies, political systems and indeed the wider global community of the profound demographic shifts brought about by falling fertility and increasing longevity. We are a multidisciplinary institute and the topics presented in this podcast series reflect the breadth of expertise exploring different aspects of population ageing, past, present and future. Each of these podcasts features an interview conducted by one of our research fellows and I'm delighted that the current series features Dr Chiara Fukaci and Dr Kate Bancroft. The opinions expressed by the interviewees do not necessarily reflect those of the Institute.

Speaker 2

Welcome to the podcast series of the Institute of Population Ageing at the University of Oxford. In this series, we're going to look at interesting aspects of why we age the way we age, and the next episode is hosted by my colleague Dr. Kate Bancroft. Let's dive in. So I am now joined by one of our early career research presenters here at the conference. So Dr. Anitha Praveen, welcome to the podcast.

Anitha Praveen

Thank you.

Speaker 2

Thank you. Would you mind just before we begin hearing about your presentation, could you mind sharing with the listeners where you're from and a bit about your work please and specialism?

Anitha Praveen

Yeah, so I'm actually from Singapore and I'm with the Future Health Technologies Program at the Singapore ETH Center. And actually our company is an affiliate of the ETH Zurich team. where we have supervisors and PIs coming from over there, bringing their technology over. And the idea is to use that and apply those technologies to solve. healthcare challenges that we are facing right now in Singapore. And one of the problems that we are focusing on is mitigating injurious falls. And so what our team does is using wearable sensors and wearable technologies as well as advanced risk

assessment methods using predictive modeling. We're trying to use all these advanced technologies to predict falls and fractures risk in the elderly populations. Because right now Singapore is one of the, we have a very, very fast growing aging population. And so we are facing a critical need to actually mitigate disabilities in the population that's caused by different comorbidities in the elderly. And one of them is fractures. Yeah.

Speaker 2

And just to clarify, so comorbidities when they have two or more illnesses or injuries at the same time?

Anitha Praveen

Yes, exactly.

Speaker 2

Okay, brilliant. your work is, talked a little bit yesterday about using wearable technologies to identify when their bodies are at risk of potentially falls and fractures and trying to put in place interventions to stop that from happening.

Anitha Praveen

Yes.

Speaker 2

Brilliant. Okay, so would you mind sharing with us today then about your presentation yesterday? So just to begin with kind of what was the context, what made you think about this, what were your research aims?

Anitha Praveen

Yeah, sure. So my presentation is titled A Novel Screening Strategy to Identify Elderly at of osteoporotic fractures. So, what we're trying to do is that we're trying to look at the clinical landscape in managing osteoporotic fractures and what are the gaps there are and how we can better improve the management of osteoporotic fractures. And osteoporosis is the condition where there's a skeletal deterioration in the elderly, and this is a condition that inevitably happens with age. So what I talk about is using our predictive model we are able to actually classify subjects in terms of low or high strengths and this strength is actually predicted from engineering analysis which is called finite element modeling and we are able to predict the strength of each person in a patient specific and non-invasive manner and this seems to have a better classification of people at high risk compared to the clinical standard which is areal bone mineral density that is used in the clinical scenario. And when we categorize the subjects into high and low strength, we found that those at high strength were the ones that were facing fractures because we were actually getting the fracture outcomes over

a 17-year follow-up period in a cohort that we actually got, which is from Iceland, is an elderly cohort that we are now analyzing. So we found that strength actually predicts the fracture outcomes better in this 17-year follow-up study that we are doing. So what we eventually would do is to replicate this methodology in the Singaporean population cohort that we are collecting right now and also assess whether the strength actually outperforms bone mineral density and is a better predictor of fracture risk in our Singaporean population.

Speaker 2

Okay. Yeah. You're saying so instead of looking at bone density, you're instead looking at the risks that what shows you? What did you say?

Anitha Praveen

Strength, patient specific strength. That's computationally measured. So we use your CT images or we can also use your DEXA images. DEXA is the imaging used to calculate bone mineral density in the clinical side. So we can use either of these images to calculate your bone strength.

Speaker 2

Yeah.

Anitha Praveen

And it's done in a patient-specific manner. So each individual will have a specific strength associated with their imaging. And that would tell us whether you're at a high risk or low risk of fracture.

Speaker 2

Yeah. That's interesting. So strength is always muscular, right? So you saying you are more at risk of falling if you have very low strength.

Anitha Praveen

So we are looking at bone strength specifically. Yeah, but of course there are lots of factors that determine whether you fracture, including your falls risk. So you could fall and not fracture and that would probably be dependent on the bone strength and the muscle strength as well. But right now we are looking at just the bone strength. We will eventually look into incorporating muscle strength as well. We have models that are doing that. But we also need to look at be mindful of the fact that this needs to be clinically implementable So we cannot have two complicated technologies that are not computationally efficient or takes too long to calculate these measures. So our technology is, we're trying to make sure that it's clinically feasible first and that, clinicians can easily click on this software or something and just get this metric out.

Speaker 2

Yeah.

Anitha Praveen

Because the last thing we want is imposing on these clinicians and they are not open to the idea of these new technologies coming in.

Speaker 2

Yeah. So you're trying to say on side as such?

Anitha Praveen

Exactly.

Speaker 2

And how many people have you used as your sample size for this?

Anitha Praveen

So for this Icelandic cohort that we're analyzing, we actually have a cohort size of close to 5,000. So this is one of the largest studies that we have that has actually analyzed. FE strength or finite element derived strength and compare that with the clinical standard which is bone mineral density and it's actually showing quite impressive results. It's showing better predictive ability and so this is probably one of the very novel studies that's right now going to be published soon that actually kind of deterministically proves that strength is better than BMD in identifying those who might be at risk.

Speaker 2

Yeah. So you've scanned as part of the project 5,000 Elder people using DEXA scans.

Yes. Okay, and how did you recruit that many people?

Anitha Praveen

Yeah, so this is a study that is actually done independently by the Icelandic Heart Association. So they started way long ago and have actually been collecting this data like many, many, like almost 20 years ago they started. And so that's why we have such a long follow-up. So it wasn't just focus, it was never even actually intended for bone health. It was actually, you know, they're looking at cardiovascular outcomes and many, many other outcomes there. And we have actually extracted the bone health predictors and trying to see whether that kind of, is anything predictive of fracture risk in that population. Yeah.

Speaker 2

So it's kind of secondary data analysis. Yeah, it is.

Anitha Praveen

Yes, correct. So now we are doing the collection in Singapore, which is what we are collecting right now. So that is about 2,500 strong. We have a cohort that's already been collected, but the one that we're actively collecting right now, it's going to be about 2,500. And we will now extend that analysis to this population cohort that we are going to be looking at.

Speaker 2

Really interesting. Thank you. So why did you get into this type of research or this topic area? Where did that come from, that interest?

Anitha Praveen

Yeah, I've always been a fan of using computational modeling and predictive analysis to solve healthcare challenges. And that has been my work ever since my undergraduate studies. So I have always been involved with using finite element modeling in my master's and my doctorate studies. And I think it's an important topic to focus on because it's not looked upon by many people because usually the conditions that they look at is like diabetes or cancer and these are the hot topics that people are always trying to look at. But there's a white space where nobody's looking at bone health in the elderly and they think that, oh, that is something that never really happens or they underestimate the severity of these conditions. And so I feel like I could make an impact in this area because in Singapore especially there's no one looking at that. And so with the help of the Singapore ETH Centre and the expertise that's coming from ETH Zurich, I think we can make a difference in Singapore and I'm excited about that.

Speaker 2

That's exciting. And what is your own academic background, so you've done a PhD, a postdoc?

Anitha Praveen

Yeah.

Speaker 2

Where did you do your PhD?

Anitha Praveen

So I'm actually a Singaporean brat and studied there. Yeah, I didn't really leave. So I did my masters and my undergraduate in the National University of Singapore. And then it so happened that my field is really very hard to find people who are actually in this field. And so happened that when I was planning to do my PhD, there was someone in Singapore who was actually doing that research in Singapore University of Technology

and Design. And so I went on to do my work with that supervisor. And then when I thought, okay, should I go elsewhere or not? I found that there was Singapore ETH Centre that was also focusing on the same work that I'm doing. And so I thought, it just fell into place as I was furthering my studies.

Speaker 2

And what surprised you about researching the elder? What do you think is the most surprising thing that you found about working with this particular group of research participants?

Anitha Praveen

I think in terms of the older populations, especially like, I mean, not just in Singapore, anywhere, I think they are stubborn. They have the, there are qualities where maybe if they don't want to see that fractures is an issue, they are not going to address it. And so there's very low awareness and like there's not enough education about this issue. And I don't personally know many people who are like, you know, like uncles or aunties who are fractured, but they don't do the necessary measures to actually mitigate the future fracture risk. Because subsequent fractures are a lot higher if you have already fractured once. And even those people are like very, they don't think they are at high risk and they just continue about their own life and not doing anything to improve their bone health in that sense. And it could be just basically physical activity, exercise. But in Singapore, a lot of people are living very sedentary lives. And so this is a big issue, I feel, in terms of the.

Speaker 2

Stubbornness. The people you've worked with have surprised you. Yeah.

Anitha Praveen

So I mean, if I tell you you've got cancer, everyone is going to go, oh my God, I know. I mean, of course I understand that. But if I say, oh, you have a high fracture risk, nobody's going to do anything about that. Yeah. So I think that has got to do with the fact that no one is aware of the problems associated with it.

Speaker 2

Yeah, definitely. So what excites you about the future with this kind of research?

Anitha Praveen

So right now with Singapore ETA Centre we are really going into the like trying to make sure we can make some policy changes and so with the analysis that we are doing and the findings that we get we hope to write a white paper next year and hope to inform the government about the fact that you know this is a huge issue and these are the findings

that we have and we need to make some changes and improve the management of osteoporotic fractures in this way and we would like to provide some guidelines on that on what should be done and I think that's what we are looking forward to.

Speaker 2

Brilliant. And any final tips that you would give people who would like to begin researching this particular topic area or groups of people?

Anitha Praveen

I think what we maybe lack right now is the social, looking at the social determinants. associated with fractures or osteoporotic fracture management like the behavioral issues like I just mentioned for example the adherence, the compliance, people not really wanting to face this issue. I think that's one thing that we may want to incorporate moving along and moving forward and yeah hopefully that might help.

Speaker 2

Yeah those research ideas. Well thank you for coming. How have you found the podcast? I mean not the podcast, the conference.

Anitha Praveen

The conference has been very very useful, a very very like inspiring actually the way the research that is done is actually truly transdisciplinary. So you have to put yourself sometimes in the shoes of those researchers and understand what they are doing. And I think it actually makes you think out-of-the-box.

Speaker 2

Definitely.

Anitha Praveen

Brilliant.

Speaker 2

I'm glad you've had a good time and thank you for joining us today.

Anitha Praveen

Thank you so much for having me.

Speaker 2

Oh, lasting. And how should people follow you or contact you if they want to hear more about your work?

Anitha Praveen

My name is Anita Praveen and you can find me on LinkedIn or yeah, yes, LinkedIn is the way to.

Speaker 2

LinkedIn best way.

Anitha Praveen

Yeah.

Speaker 2

Brilliant. Thank you.

Anitha Praveen

Thank you so much.