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| Speaker | Professor Markus Schlaich |
| Talk title | The silent killer: keeping hypertension under control |
| Venue | The Deck – Grand Bar & Bistro |
| Time | Tuesday 29 October 2019, 7.00pm |

Dr Laila Simpson

Hello and Good Evening. I hope you are having a nice time and that you have had a chance to get a drink and that you are enjoying the venue.

Welcome to Raising the Bar. Tonight, we have got twenty-two academics talking in ten bars across Perth and this is a part of making education a part of our cities popular culture, so we are transforming our local city bars into a place where you can enjoy a drink, whilst learning about the impact that our research has had in our community.

So, just to begin this evening, I would like to acknowledge the Whadjuk Noongar people as the traditional owners of the lands and waters where we are meeting here today and to pay my respects to the elders, past, present and emerging.

If you are going to share pictures of this evening today on your social media, could please tag @UWAresearch or #rtbperth19 and that is just so we can share your posts and be part of your evening as well.

The other thing about tonight's talks are being recorded and they will be published as podcasts and we will be broadcasting them through our social media channels. So if you did look through the Raising the Bar selection and trouble selecting your talks tonight, you can actually in the future, listen to the podcasts for the talks that you didn't get to go to.

And just on a practical point, with that in mind, if you can hold questions that you have for Markus until the end and just wait for the mic to come to you so that we can actually capture your question.

So tonight's main event is Professor Markus Schlaich. He is a specialist in kidney disease and high blood pressure and he runs the Hypertension Services at Royal Perth Hospital. He holds the Inaugural Dobney Chair in Clinical Research at the University of Western Australia and his work focuses on novel treatment therapies for hypertension and its complications, including strokes, heart attacks and kidney failure and tonight he is going to tell us about keeping the "Silent Killer" under control.

So thank you, Markus.

[clapping]



Professor Markus Schlaich

Thank you very much, thank you.

[clapping]

This is probably the most comfortable environment I have given a talk in. I have never had a beer in my hand while I am talking, so that's new for me. I think this is a very exciting initiative, Raising the Bar in various aspects and it is great to see people coming to these types of events and spending part of your spare time, I assume most of you have just finished work and come here, so it is wonderful to see you all.

I have prepared a three-hour presentation and I hope you are all willing to stay that long. There is no free food unfortunately but seriously, I will try to give you a bit of an insight about high blood pressure in twenty to twenty-five minutes and then we have ample time for questions and I really would encourage you to take the opportunity to ask questions. The simple questions are often the most exciting ones and the most difficult to answer, so, please don't be shy to ask personal questions or whatever you want, I am here for you tonight.

Before we start, could I perhaps ask just by raise of hands in the audience, who knows their blood pressure? Who knows their numbers? Can you just raise your hands? Wow! That's fantastic! That tells me that a lot of you are potentially affected by elevated blood pressure or may have somebody in the family, hence your interest and this is very important because around half of the patients, 50%, I shouldn't say patients but half of the people who have elevated blood pressure, they run around and they don't know about it and we have done quite a few studies, epidemiological studies. We ran the so-called May Measurement Month over the last three years and we know very well that around a third of the adult population, so every third person here, theoretically, has hypertension or elevated blood pressure and the question is of course, "Why is that relevant?" It is very relevant because we know that elevated blood pressure is a very important risk factor for a lot of the cardiovascular conditions which are unfortunately often lethal. We are talking about strokes, we are talking about heart attacks, we are talking about kidney failure, we are talking about heart failure and elevated blood pressure is one of the most important risk factors for these conditions.

So, if you want to avoid or reduce your risk trying to bring your blood pressure down to normal levels, is a very important aspect.

Now as you already can tell from my funny accent, I am not originally from Australia, I am originally from Germany. From the south of Germany, Freiburg in the Black Forest area is my hometown and you may wonder, "What is a German doing in Australia?" Well, Australia is extremely good in many ways but they certainly punch above their weight in science and research and the University of Western Australia is very dedicated to research into very important areas including high blood



pressure and many others and I came to Australia to do more research in that space and it is a fabulous place to be here.

Anecdotally when I start talking to patients, they sometimes tell me, “Oh, you remind me of someone, you remind me of someone,” and then it comes to them, “Oh yes, you remind me of Arnold Schwarzenegger.” But I have no relation with Arnold Schwarzenegger, unfortunately, otherwise, I would have brought him to talk about his own experience. He, by the way, has elevated blood pressure. I am not his physician but I could think about a few things he could do to improve it.

Now, what I wanted to talk about is just to give you a bit of an idea about the problem worldwide. I would like to briefly talk about what blood pressure actually is. What causes elevated blood pressure and what you can do about elevated blood pressure if you have it? The types of treatment we have available to bring the blood pressure down and the last one is perhaps a bit more research-orientated, what are the new treatments we are working on for the future, which may be very relevant, in particular for those in whom it is difficult to control the blood pressure.

So, what is blood pressure in the first place? If you put your hand under your arm and you can palpate your pulse in the neck or the arm and what you feel is the pulse and the pulse is obviously generated whenever your heart pumps. Your heart pumps sixty to eight minutes, ideally, times per minute and each time the heart and the left ventricle in particular contracts, it pushes out a certain amount of blood into the circulation to supply the brain, the vital organs, such as the heart, the liver the kidneys essentially with blood supply and this is what you feel.

If you measure your blood pressure, we typically have two important numbers.

One is the so-called systolic blood pressure, which is the higher one, the first one when you read the blood pressure and this is the maximum blood pressure that is generated when the heart contracts and pushes the volume out into the circulation. But then the heart relaxes and the blood pressure drops and when the heart relaxes most, this is when we measure the second number, the so-called diastolic blood pressure. I often get the question, “well, which one is the more important” and that is not that easy to answer. Both levels are certainly important but there is general agreement these days that the systolic blood pressure is more important because you can imagine that maximum blood pressure that really pushes a lot of strain on your vessels will do the damage. A good example is a stroke.

If you have plaque atherosclerosis, for example, in the carotid artery, the artery in the neck or somewhere in the brain and you have very high blood pressure at any given time, that pressure will have put a lot of strain on the vessel and if you have a vulnerable plaque, the shear stress that is generated by that high blood pressure, may shear off the cap off the plaque and that is when you develop a stroke or if it occurs in the heart, you develop a heart attack. And, we know that, for example, if you do a twenty-four-hour blood pressure monitor which is what we consider the gold standard in assessing blood pressure, the maximum blood pressure during that period, determines your risk of having a stroke quite well.



So, while you would like to control overall blood pressure across that period of time, you also want to make sure that your maximum blood pressure is not at levels that are dangerous and can cause that type of problem.

Mechanistically or mechanically, rather, blood pressure is quite a simple thing and it is relatively easy to measure, in fact, you can measure it at home and I advise most of my patients to spend perhaps a hundred dollars to purchase a home blood pressure machine. These are quite dedicated and sophisticated devices these days, where you have a bit of control of your own management, where you can get a bit of an idea about the blood pressure and that is important because you may have heard about the so-called “white coat component” or “white coat effect” and this is a very well described phenomenon whereby if you come to a doctors practice and the nurse or the doctor take the blood pressure, we typically know the blood pressure at that time, tends to be a bit higher than it usually is.

This is due to the fact that you are perhaps a bit anxious. You typically come to a medical practice because you have an issue and you know that your blood pressure may be high and now you are concerned it is even higher so that stress type, raises the blood pressure to some extent and that is what we refer to as the “white coat component.”

If we want to measure blood pressure appropriately, we want you to, and if you do this at home, we want you to sit simply for around five minutes, relax, sit with your back supported without the legs crossed, because if you cross your legs that can raise the blood pressure by about five to seven points. So, if you get a lot of variability with your blood pressure at home, you have to make sure that you position yourself correctly, that you put the cuff around your upper arm and the correctly sized cuff around the upper arm and follow certain rules. But, home blood pressure monitoring is a very powerful way of assessing your blood pressure and getting a bit of a better idea of where you are.

Your doctor or the nurses in the practice will measure blood pressure as well, but there is one, as I mentioned already, gold standard and this is a twenty-four-hour blood pressure monitor. Could I have another raise of hands, who in the audience have had a twenty-four-hour blood pressure monitor, so far? One, two, three, four, five. Okay. A few. And we see a bit of a dilemma here already. In the UK for example, it is recommended that every person who has evidence of mildly elevated blood pressure should get one of these twenty-four-hour blood pressure monitors and you can imagine what these devices do. They measure blood pressure around every fifteen to twenty minutes during day time, but they also measure your blood pressure during night time and that is a very important aspect. So, we get a very nice circadian pattern of your blood pressure profile and that is important because it can give us a lot of clues.

Anybody in the audience, if you don't want to don't have to raise a hand, but who has obstructive sleep apnoea? This is disturbed sleeping patterns during night time when people wake up for example and gasp for air, are tired during the day time. If you have this condition, your blood pressure during night time is significantly elevated and that increases the risk again for heart attacks



and strokes and obviously you are not going to measure your own blood pressure while you are asleep, you can't, but this is what these twenty-four hour blood pressure monitors can do and they often tell us and give us, the reason why people may have had cardiovascular events despite the fact that at other times of the day, the blood pressure seems to be quite okay.

So, one of the areas we are working on is to make these twenty-four-hour blood pressure monitors more available to people. At the moment if you want to have one of those monitors, you typically have an out of pocket expense of around \$70 to \$80 and not everybody can afford that, but we have initiatives in place to make that more widely available, so that is an important aspect.

How many people are affected, I mentioned already, in Australia and it is very similar in most westernised countries and in fact also in developing countries, around a third of the adult population suffer from elevated blood pressure and the way we define blood pressure is typically by a threshold of 140/90 millimetres of mercury. So, if you measure your blood pressure at home and your numbers are above that threshold, you very likely have high blood pressure or hypertension and the higher the blood pressure, the more severe the hypertension and you can imagine that increases your risk further. In fact, there is almost a linear relationship between the level of blood pressure and between your risk of having a stroke or a heart attack down the track, so it is an important thing to consider.

Worldwide there are around ten and a half million deaths every year, ten and a half million deaths which are directly attributable to uncontrolled blood pressure and that gives you an idea of how important blood pressure is. It is the biggest killer worldwide.

If we were able to control the blood pressure of everyone in the world, we would dramatically reduce the mortality across the globe. So, what can we do with it? What causes blood pressure and how can we treat it?

I have talked already to some people here and what I hear very frequently, is that elevated blood pressure runs in families and it is very clear that there is a genetic component. So, if your parents had elevated blood pressure, your grandparents had elevated blood pressure, you are more likely to have elevated blood pressure yourself. If you don't know your numbers and you know that someone in the family has elevated blood pressure, the least you should do is have your blood pressure measured to get an idea where you are. You may be lucky and it is perfectly normal and that's great to know but it is very possible that you may not be so lucky and your blood pressure is elevated as well. So know your numbers, that is important.

Now, while we are working towards this at this stage, we can't really do much about our genes. We are born with our genes and we have to live with them for our life and there are potential therapies down the track, but at this stage we cannot do much about the genes but there are a lot of factors that contribute to elevated blood pressure which are in our control and this brings us to lifestyle modification.



Theoretically, while talking about blood pressure, I shouldn't have a beer in my hand because alcohol or rather, excessive alcohol consumption, very clearly can raise blood pressure and we typically recommend not more than two standard drinks on any day. That is the definitions from the National Health and Medical Research Council and there is nothing wrong with enjoying a good glass of red wine or a beer here or there but it should not be your daily routine and that is one of the measures you can work on.

Smoking is, of course, a very important one. A sedentary lifestyle. Unfortunately, the majority of us, pretty much probably sit behind a desk most of the day and we don't get much exercise and we are physically not very active and that is another contributor to raise the blood pressure.

The biggest factor is probably excess weight. Overweight and obesity are very important determinants of elevated blood pressure and there are estimations that around 70% (seven zero) seventy per cent of all the blood pressure or hypertension we see, is directly associated with overweight and obesity and if we were to manage to reduce the body weight in most patients we would typically see a significant reduction in blood pressure. So, a lot of things that are in your own control, where you don't need medication and you can achieve significant blood pressure reductions.

Diet is another one. A healthy diet, fruit, vegetables etc., fish, for example, meat, here and there but not all the time and I am sure you have heard about that before. So, lots of things you can do.

I see a lot of patients where it is very difficult to control hypertension and I always talk to them about lifestyle but then they have other issues. They may have osteoarthritis and they cannot exercise because of pain and that's a good excuse in a sense, but we cannot accept just to leave the blood pressure there, so we have to do and apply additional measures.

We are very fortunate, not only in the area of high blood pressure but in other very common conditions these days. For example, high glucose levels, diabetes or high cholesterol levels are all other very important risk factors for heart attacks and strokes, in that we have excellent medications and drugs that are generally quite powerful and in most cases, quite well tolerable and the important thing though is, if your doctor prescribes medication it is, of course, crucial that you actually take the medication and we know very well, particularly if you have five or six tablets to take, that is not always easy and sometimes you would just like to forget about them, but the way drugs work in general is, you pop a pill, the pill then needs some time to be digested to release the active compounds in your bloodstream to then cause their effect and most of the drugs are designed that they act and work for around twenty-four hours which is, of course, handy and then you only have to take that tablet but you have to take it regularly every day, because if you forget your tablet or you purposely don't take them, the concentration of the drug will fall quite quickly and the effect will disappear.



So, these tablets, in general, do not cure your high blood pressure but they control the blood pressure and if you manage to control your blood pressure you have a great chance to avoid heart attacks, strokes, kidney failure and heart failure.

We have done some studies in patient cohorts we describe as having resistant hypertension and resistant hypertension is defined as the blood pressure not being controlled so above target levels despite patients being prescribed three or more blood pressure, lowering medications. So, for some reason it is difficult to control their blood pressure because, in most people, two drugs is all you need to control blood pressure very well and what we have done is, we have measured the concentration of the prescribed medication, either in the blood or the urine of these patients and on average, these patients were on four and a half, blood pressure pills and when we looked at the concentration of the metabolising of these drugs in the urine, 30%, thirty per cent! Did not have a single trace of any of those drugs in their urine. In other words, they did not take any medication and then, of course, no wonder that the blood pressure is not controlled, it has nothing to do with that they are resistant to the drugs it is just the fact that they don't take their pills.

Another twenty to twenty-five per cent took some of the drugs but not all of them. As medical doctors, we study medicine typically for six or seven years and we should have a reasonably good idea which drugs work well together and that is typically what we prescribe. So, if you have concerns, it is really crucial that you talk to your doctor if you have side effects which can always occur with medications. Mention them to your doctor, raise the issue, don't tell him you are taking the medication but you are not, because that is no help for anyone. The doctors are generally very open-minded and will help you no matter what, but if we are not honest with each other, it is simply not going to work.

Side effects can occur and some of the drugs have side effects. We have got very powerful drugs, for example, calcium channel blockers are a common side effect which in particular, younger women don't like is, the lower extremities, the ankles sometimes swell a bit and you know there are ways of getting around this for example, but you have to raise it and then discuss it with your doctors. The majority though, are quite well tolerated and there is really no issue as long as you take them.

Now, even if you take your medication, there are patients in whom it is truly difficult to get the blood pressure under control and one very common problem there is high salt intake and that is sometimes difficult to escape. When I see a patient, I always ask them, "do you add salt to your meals" or "do you consume a high load of salt" and let me tell you, 98% of the patients say, "Oh, no, no, no I don't add any salt" and then they may be correct but salt is in a lot of processed foods, a lot of takeaways, soy sauce is a very common source of salt. Vegemite in Australia, of course, is a common source of salt and certain types of bread contain a lot of salt, so, these are things that we may not necessarily think about but we have to try to educate the patients to understand where that may come from because a lot of drugs do not work as good as they could in the presence of a high salt diet.



Again, that doesn't mean you have to get rid of all the salt because then the food may not be as tasty, but reducing that to some extent can make a huge difference in terms of how your medications work and bring the blood pressure down to healthier and better levels, so that is an important aspect.

At the Royal Perth Hospital and UWA and one of the reasons I came to Perth initially from Melbourne, was, we do understand the problems people have, we do understand that not everybody is really happy and willing to take medications. We have quite a number of patients who are truly intolerant to a number of medications. They have allergies for example to some of the compounds in the medication, not necessarily the active drug but cellulose and starch and other things and they have issues with a lot of other medications and, you know, we can't afford just to say, "Okay, look, we have done everything, it's your problem now." We have been working a lot on novel approaches to try to lower blood pressure and these are so-called interventional approaches. What we mean by "interventional", someone in the audience may have had a coronary angiogram where you typically gain access through a groin artery and you can advance a catheter, a tube, for example, into the heart and you inject a bit of dye and you get a beautiful image of your coronary arteries and you can see whether there is a blockage perhaps, or a narrowing and that could be the precursor of a heart attack and we have developed a number of these approaches where we can place catheters in certain areas of the body and through these catheters we can apply certain types of energy such as therapeutic ultrasound or radio waves and what we can target with these waves is nerves that sit around these blood vessels, so-called "sympathetic nerves" and we have done a lot of research in that space. The "sympathetic nervous system" is part of our "autonomic nervous system" which amongst a whole range of other things controls blood pressure.

If you are stressed for example, if you have to give a talk prior to this, coming here, my heart rate was probably up, my blood pressure was up a bit and that is good in that sense because it pushes more blood to my brain, so when I talk, hopefully, I make sense and engage you to some extent. But when I stop talking and have a beer my blood pressure will drop, my heart rate will come down and that is great but there are a lot of people in whom this "sympathetic nervous system" is constantly activated and if you imagine this is just pushing all the time, raising the blood pressure up, that will have an impact on your blood vessels, on your organs such as the heart, the brain, the kidneys down the track, so, anxious people, people who are very stressed, they tend to have high blood pressure and that is often mediated via these "sympathetic nerves."

Again, these are novel approaches where we try to come up with a one-off procedure to not necessarily always be able to control the blood pressure to perfect levels but to bring the blood pressure down to more reasonable levels and thereby reducing the risk for those affected patients to develop heart attacks, strokes etc.

At the moment, these are available, some of these techniques are approved and we are not using them as a first-line therapy because it is still reasonably invasive and we know that drugs are safe and lifestyle is safe but then again it is wonderful to have these alternatives if needed and if anyone of you has very difficult to control blood pressure, it is perhaps worthwhile to talk to your GP about



it and mention that there are options of dealing with this and we would be very happy of course to see you.

The final point I would like to make in this context is again, we do a lot of research and we would really encourage people to engage and participate in studies. Without studies, without really investigating whether or not a new drug or a new procedure really makes a difference, we will not be able to make advances in medicine and typically the people who participate do benefit and in fact, we know as a fact that if you participate in a study, you do better than the same person not participating in a study and there are various reasons for that, you are thoroughly being looked after, you are being seen more frequently, there is a bit more motivation to do the right thing so participating in research has benefits in itself but apart from looking at yourself, you really serve the community and you may contribute to establishing new therapies for generations or for your own children, to come.

So, at UWA and Royal Perth Hospital and this is partly why we are doing these talks, we want to get messages out there, we want to let people know what is available, what are the state of the art technologies that are available to deal with those conditions but we need your help, both as a patient and hopefully you are not a patient, hopefully everything is fine, but if you are one, this is what we need in order to treat you as good as we can but also in terms of a service to the community, in terms of helping to advance medicine which we are all very, very much interested in.

So, take-home messages are pretty much, know your numbers! If you don't know your number, if you didn't raise your hand just before, next time you see your GP, ask him, "what is my blood pressure, what are my numbers" and perhaps note them down and remember it is about 140/90 you should do something about it.

Check with your family, whether somebody in the family has high blood pressure, brother, sisters, parents etc. If they have, again, have your blood pressure measured.

Live a healthy lifestyle, exercise, no French Fries [laughing] I will have to take them off you now [laughing] and exercise, alcohol in moderation, don't smoke, a healthy balanced diet and again, that doesn't mean you could have a treat here and there, but apply common sense and this is often all that it takes, but if not, we have got fantastic colleagues in General Practice and at all the major hospitals we have here. We have great technologies available to help to manage your blood pressure but you have to make the first step, together with your GP and move it forward.

So, with that, I leave it and we have an opportunity for questions. Please, we encourage any questions you have, that is what we are here for. Please, please fire!

Thank you very much for coming and a great please to be here, thank you.

Dr Laila Simpson

Thank you, Markus. I am actually going to take the opportunity to ask you a question first.



My family has quite the history of hypertension in it and my husband's family does not, but it is quite easy for my husband to know his numbers because it doesn't matter what he goes into the GP for, they will take his blood pressure whereas I notice that service is not actually given to me and I am just wondering whether that diagnostic bias is correct and healthy?

Professor Markus Schlaich

It is unfortunately true, so, what is recommended in the General Practitioner world, whenever you see a patient for the first time, you should definitely measure the blood pressure. So, these are just basics, you want to know the heart rate, you will palpate the pulse because simply if the pulse is irregular that could be a sign of some form of heart disease. So, these are very simple, very cheap, inexpensive methods to get a first-hand idea about your general health.

GP's of course, are very busy and theoretically at every encounter with you as a patient, for whatever reason you come, ideally, they should measure blood pressure. But, if you put yourself in their shoes, you know the waiting rooms are typically full and if somebody comes with a cough and fever and they probably have a chest infection and they are there to get an antibiotic, a GP might not always measure the blood pressure. Again, we have to apply common sense but, in general, when you go to your GP next time and he or she has never measured your blood pressure, I would ask him and say, "have you ever measured my blood pressure, do you what my numbers are, because I would like to know, because I heard that this is really an important risk factor." Work as a team, encourage them to give you the numbers, but it is important to know.

If it is normal, that is great, that's fantastic, that's very reassuring and we still would want the GP's to measure it regularly because we know with increasing age, unfortunately blood pressure tends to go up, so in younger ones, it tends to be lower but very clearly it creeps up over time and you may want to measure it more frequently. If it's normal, it's great but if it's not, that's the time to do something about it before the elevated blood pressure has caused damage to the heart or the vessels or the brain.

Audience

Firstly, thank you very much, Markus, obviously, the beer worked well because it was a brilliant lecture/talk.

I would like to ask you a couple of questions:

- (a) What do you think of the sleep machines for sleep apnoea? and
- (b) How does one get onto your research program?

Professor Markus Schlaich

Thank you very much for these questions, very important.



I talked about obstructive sleep apnoea before, so this is quite a common condition, mostly again in overweight and obese patients with a big neck circumference and the beer belly and what happens there is, you can imagine if you have a big neck and then you lie down which you usually do when you go to bed. The circumference of your neck can actually partly close the pharynx and that means that you don't get enough air and the body copes with that for a certain period of time but if your partner or any of your partners who suffers from obstructive sleep apnoea, they are not very much bothered by it, but you as the partner, because what you hear is that they wake up and makes these noises like [snoring sound and deep breathing] and then they take a deep breath and then they have phases of apnoea where they don't breathe properly very frequently during night time and we know very well that that can raise blood pressure, not only during the night but also during the day, so how do we treat sleep apnoea?

Weight loss, of course, is an important one which works often, just by losing weight, you put a bit less pressure on the neck area and that can relieve it, but what is done very commonly, is you have to typically have a proper sleep study, where you go to a sleep laboratory and you will spend a night there and they put a lot of electrodes and probes on your fingers to get a bit of an idea about your sleeping pattern, but that is extremely important to then advise what may be the best thing.

Sometimes, it is as simple as sleeping on your side rather than on your back because if you are on your side, the pressure on the pharynx is less pronounced and you may breathe quite normally. In other cases, you may need a specific device called a C-PAP machine. C-PAP stands for Continuous Positive Airway Pressure. A little device and there are a whole range of devices some with masks or little tubes. The device generates a pressure that keeps the airways open during the night and again, that is not the most pleasant thing to wear but if you are affected by the condition, these patients are often tired during day time. They actually fall asleep at their desk or worst-case scenario while they are driving a car or a truck and if you identify it and if you put them on these machines, it is like day and night. They say, "Oh my God, feel much better, I am much more alert," and it can make a huge difference. Very common, very important, closely associated with obesity and elevated blood pressure.

We in our clinic and I have some of my colleagues here, we do that routinely in our patients, we have a little device that we can use as a screening tool and in patients at home, the blood pressure is difficult to control. We see this is evident in around 70%, so again, very, very common and you don't know about it until you look for it and you measure it and once we know about it again, we have got different ways of dealing with it that can be adjusted to your individual circumstances, but a very important point you raise.

Dr Laila Simpson

I am going to roam around a little bit. Can you raise your hand if you have a question and don't be shy and don't leave me hanging, come on, someone have a question?

Audience



How can you tweak your diet to lower your blood pressure?

Professor Markus Schlaich

Diet is very important and a very simple thing is, I see a lot of people with high blood pressure and a common pattern is significant alcohol intake. Now, a beer for example, aside from being quite pleasant, it has a lot of calories in it, so it contributes to excess weight. Alcohol in excess has been associated pretty much with everything you don't want. Cancer, cancer of certain areas, stomach cancer, oesophagus cancer, and liver cancer in particular, so, that is an important aspect.

Unfortunately, and interestingly and it is not quite clear why that is the case, more and more frequently we see younger women who have elevated blood pressure and there seems to be a very close relation with alcohol consumption. Women, fortunately, or unfortunately, tend to tolerate alcohol less than males and that is due to an enzyme that is a bit more active in males than in females and that may contribute to that scenario but the reduction in alcohol is a very important one.

Smoking is the other one, where the nicotine and the smoking accelerates the development of atherosclerosis plaques in the arteries, which then, of course, make the arteries stiff and you can imagine if your heart has to pump a certain volume, a certain amount of blood through that vascular system, the stiffer that system is, the higher the pressure will be in the system and that is a vicious cycle that high pressure then further stimulates the development of atherosclerosis and makes the situation worse. So the best thing is to stop smoking. In fact we know that a lot of the effects actually regress over time, so if you have stopped smoking for five or six years, your risk of lung cancer and other does come down. It doesn't get to exactly the same levels as if you have never smoked but it is never too late to stop smoking and often people, unfortunately, come with a heart attack or so and then they realise and that's the motivation to stop but it should have been done more frequently.

The other things then are a generally balanced diet. There is the two-plus five simple rule. Have two fruits and five veggies every day. Fish is good. Certain types of oil are good. Nuts tend to be very healthy. Dark chocolate at times, not all the time, it shouldn't be a routine diet but that has been shown to have some beneficial effects and in fact a good glass of red wine can sometimes stimulate positive molecules in your bloodstream and there is the so-called French paradox which you may have heard about.

The French, the "Savoir Vivre" they know how to live, they generally have a pretty good lifestyle. The French love to have a glass wine but they also tend to be able to relax a bit more, they are very social and these are all important factors that come together, so they balance each other out. The worst is if you are binge drinker or regularly drink every night, your six or seven or eight stubbies or even more, but again, if you do apply common sense and have a good meal with a glass of wine, that is perfectly fine. You don't have to live like a saint, but everything in moderation. That for me is really a golden rule. Extremes tend never to be a good idea, either way, but if you follow simple rules, a



balanced lifestyle, that gets you very far. It doesn't always solve the problem but it can make a big difference but then again, if you may require medication, a lot of drugs work better together with a good and healthy diet.

Exercise is the other important component to it and people are often frustrated. When I see them first, we discuss all these things and then they come back and say, "I go the gym, I have exercised but I haven't lost weight." Exercise is actually not a great way of losing weight but what it does of course, if you have a lot of fat tissue, adipose tissue and you start to exercise, you transform fatty tissue into muscle tissue and that's great, but your net weight may not change much but your body composition does. So, exercise together with a diet can definitely help to lose weight but the most beneficial effective exercise is actually that you develop your muscles and muscles are extremely good in soaking up glucose in the circulation and that helps to prevent diabetes, for example. So, even if you are quite big, if you exercise, you can still metabolically be reasonably healthy, so I guess the message there, is no matter where you are at, at any level, exercise and good diet will have beneficial effects and if you can manage to get to a perfectly normal weight, that's great of course. There are incremental benefits of that, but I always encourage people and try to set realistic goals. It is not realistic if you say, "Go out there and I want to see you in two months and you must have lost 30 kilograms." Impossible! Except if have perhaps bariatric surgery or something, but even then

Set realistic goals and lifestyle is not a sprint, it's a marathon and that works best if your family or your partner is engaged in that as well. If you are in a family of five for example and they all eat their French Fries all the time but you are the only one who should have a specific diet, it is extremely hard if the entire family consumes the same diet and then they all work together as a team, that makes it a bit easier. There are a lot of little hints and tips which can improve that but adhering to a healthy lifestyle may mean that you may never need any medication for anything and if you need it, the number of drugs may be much less than you would need if you don't adhere to a healthy lifestyle, so it is really still the core of everything we are doing but we very much realise how hard it is to change your lifestyle. We like what we are doing, humans don't like to change if they don't have to and that's where a certain event or so or a problem in a close family member triggers the motivation to get started and you should try to jump on that bandwagon if you can.

Any other questions? Again, don't be shy. There is one there.

Audience

I was just wondering, do you know if there is much correlation of contributing factors with the contraceptive pill and hypertension?

Professor Markus Schlaich

Excellent question.



Of course younger women, males are not affected by this luckily, but oral contraceptives are an issue and there are different oral contraceptives, so it depends a bit on the composition of the “pill” in terms of the oestrogen that is in there and has been a lot of studies.

It was clear that if young females or middle-aged females are on the oral contraceptives, there is a slightly increased likelihood, for example, of thrombotic events, deep vein thrombosis and other things and that has to do with the types of hormones that are in there and the industry was very aware of the and has really changed the composition of a lot of oral contraceptives to ensure to reduce this risk.

We do see young females, when I see a patient in that age range from twenty to forty, forty-five, we always ask whether or not they use oral contraceptives and it can have an impact on blood pressure.

The way that often works is some of the contraceptives, oral contraceptives, they induce retention of fluid. If you think about your vascular system as a hose, a big hose that kind of circulates which is a closed system and it just circulates. If there is more fluid and more volume in that hose, what happens, the pressure in the hose will increase. So, that is how these tablets can sometimes raise the blood pressure and if it's difficult, we often do a trial and say, “stop it for two months”, be careful of course and protect yourself otherwise, and we will see whether or not the drug may have an effect thoroughly at the blood pressure.

Frequently, we see that it may have an impact but in some others we don't see any effect at all, so it is very hard to predict but again, the gynaecologists, for example and GP's if they prescribe the drugs, they know that they should measure blood pressure before and get a good idea where you are at and if you already have elevated blood pressure to start off with, they typically would inform you with these medications that there is a possibility that their blood pressure go up and we want to monitor that a bit more closely, perhaps choose the right “pill” for your circumstances and at the same time, encourage people to live a healthy lifestyle to reduce all the other potential factors, but it is a known side effect of oral contraceptives and I have got a number of patients in whom we decided to stop it and find other ways of doing that just to ensure that we get the blood pressure under better control.

So, a very good example of how other medications can interfere with blood pressure and another good example, more so, typically in the elderly, painkillers, so-called non-steroidal anti-inflammatories, Nurofen, Voltaren and Naproxen which are great drugs for osteoarthritis and they work beautifully but again the mode of action is that they inhibit certain hormones called and these prostaglandins, they mediate pain sensation, so that is great and by using this drug you get rid of the pain and patients feel great, but these prostaglandins are also very potent vasodilators, so they open up your blood vessels. If you inhibit them, what happens, the blood pressure is smaller or the diameter gets smaller and what does that do, obviously it raises the blood pressure again.

When we treat patients with elevated blood pressure, we always ask whether or not they are on any other medications for other reasons that may interfere with blood pressure control. Oral



contraceptives is one, non-steroidal anti-inflammatory drugs are another one. Corticosteroids, cortisone, commonly used for auto-immune diseases for certain infectious diseases etc., they are very well known to raise blood pressure.

Luckily if you need cortisone we will typically try to keep you on those drugs only for a limited period of time so that's fine, but if you are on long term treatment with corticosteroids, they again are very well known to raise blood pressure.

In young people using illicit drugs, for example, are very common.

Amphetamines, the most common reason for young people to be seen in the emergency department, typically with extremely high blood pressure is the use of illicit drugs and amphetamines and that can be disastrous. Seeing strokes in twenty-year-olds is really what you don't want to see in the emergency department but then can happen through these drugs.

Knowing what else you are on is very helpful and just by perhaps replacing those medications with others that may not have an effect on blood pressure can make a huge difference. So, that is what you GP or your doctor should look at typically to find the right mix and cocktail if you wish, cocktail in a bar for you.

Any other questions?

Yes, there are two down there.

Audience

Is there any correlation for increasing the risk for hypertension and hemochromatosis?

That is an excellent question.

So the question is hemochromatosis is hereditary. Here comes my German background, I need another beer to say that properly!

So, this is a condition where we have issues with iron stores. There is too much iron in the body and that affects predominantly the liver and can cause severe liver disease and problems there but it has also impact on a whole range of other organs, the kidneys for example and it has also been associated with elevated blood pressure.

Now, obviously, this is an example where you want to treat the underlying condition, so obviously the blood pressure is very high and you still want to use some medications to lower blood pressure but the obvious and logical thing to do is to treat the hemochromatosis, for example, and one treatment commonly done is just a bigger section, so these people go to the blood bank and they typically withdraw 500 mls at any time to reduce the iron stores in the blood and that typically deals with it. Not always but a general principle in medicine, and this is why we do a lot of diagnostic work. If you have a problem, we want to sort out what is the root of the problem. While we often treat the



symptoms, the best way of dealing with the problem is, of course, to remove the source of it and that is the best way of dealing with it if you can and that would be an example where you try to treat the underlying condition, if it hasn't been a problem for too long, there is a very good chance that if the blood pressure is raised through that you will get it back to normal levels and you may not need any other medication. If it doesn't come down, you are typically well-controlled with one or two medications and you are well protected.

Dr Laila Simpson

We might make this our last question.

Audience

I was just wondering if there is any correlation between high blood pressure and your eye pressure.

Professor Markus Schlaich

The question is, is there a correlation between the blood pressure in the vascular system and the eye pressure.

For those who wear glasses or have a history of eye disease in the family. If you go to ophthalmologists, they typically look at the back of the eye, which we also do, but they also measure the intraocular pressure and this is pretty much the worst scenario is glaucoma where you have increased pressure in the eye which can affect your eyesight and ultimately, potentially lead to blindness if you are not treating it appropriately and indeed there is a relation with systemic hypertension elevated blood pressure, not in all the cases but what we do routinely in patients we see, we do a physical examination, we listen to their heart, their lungs, we listen to whether or not we can hear any noises in the so-called [inaudible 1:00:42] over the vessels but the eye is a fascinating organ. It is the only part in the human body where you can visualise blood vessels, so we have these hand-held ophthalmoscopes where we can look in the eye of a patient and through the pupil, you see blood vessels at the back of the eye, particularly in patients with diabetes where the high glucose in the circulation damages the vessels and the surrounding tissue. We also see that very typically in patients with high blood pressure and you see that there were blood vessels are typically very [inaudible 1:01:23] you see little aneurysms of these blood vessels, you see little bleeds which in a very acute situation can cause acute blindness in some of those patients and there is a link to the pressure in the eye, so what you want to do is you want to measure the pressure in the eye but you also want to know what your systemic pressure is and you treat both, the intraocular pressure typically with eye drops which then open up certain channels to reduce the pressure but at the same time you want to make sure that the pressure in the general vascular system is at good levels as well.

A very good point.



The organs that are affected by high blood pressure are predominately the brain, hence the strokes, the eyes, the heart and the kidneys. So, those organs that are being fed directly from the main artery which mediate and accelerate the pressure generated by the heart.

A very good point and if you want to avoid a stroke, eye problems, heart problems and kidney problems, do the right thing and come to these talks and have a drink!

Dr Laila Simpson

Can you take a moment and thank Markus with me.

[clapping] [whistling]

That concludes this evening, obviously, you are very welcome to keep kicking on at this venue.

Do have a lookout for the stuff that will come out on social media that directs you to the podcasts and they will be mounted on the UWA website at some point as well.

Thank you very much for coming tonight.

[clapping]