00:00:00:00 - 00:00:16:01

Clare

Hello and welcome. I'm Clare and you're listening to Microbe Talk, the podcast by the Microbiology Society.

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Clare

It's World Antimicrobial Resistance Awareness Week this week. So I spoke to Doctor Sanjay Patel to find out more about an often underrepresented group in the AMR conversation, young children and neonates, and his work on tackling the problem.

00:00:33:19 - 00:00:46:19

Sanjay Patel

Yes. My name's Sanjay Patel. I'm a Paediatric Infectious Diseases Consultant based at Southampton Children's Hospital. And I'm also the National Clinical advisor for Paediatric AMS, NHS England.

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Clare

You mentioned AMS. That's antimicrobial stewardship. Could you give me kind of an overview of what antimicrobial stewardship means?

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Sanjay Patel

So AMR is clearly the the big ticket item. And to address AMR, we've got lots of strategies is one is AMS antimicrobial stewardship. That's how we use antibiotic antimicrobials infection prevention and control IPC is also really important. Approach that we use to, reduce the spread of resistant organisms. Vaccines are super important. So sanitation and access to clean water.

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Sanjay Patel

So Amr is is the whole of the Venn diagram. And then there are certain circles within it. And, that's what my role within NHS England is.

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Clare

Yeah. Because it's interesting you bring in infection control practices into antimicrobial stewardship. I think people would be forgiven for potentially thinking that stewardship is literally just about prescribing of antimicrobials, but actually taking care of the ones we do have is also making sure that that those kind of antimicrobial resistance genes don't a less frequent in the first place.

00:02:00:05 - 00:02:22:24

Sanjay Patel

Well, that's absolutely right. If we have if we're overwhelmed with resistant organisms, we're going to be forced to use broader and broader spectrum antibiotics. We're going to be forced to use our novel antimicrobial. So it's just as important to think about how infections are spread and to try and limit minimize that spread as it is to think about how we use antibiotics and antimicrobials.

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Sanjay Patel

Definitely.

00:02:25:14 - 00:02:44:08

Clare

And so you're here today to talk about sort of neonatal pediatric antimicrobial resistance. Could you give me maybe a brief overview of what the sort of current situation is, in that particular area of the antimicrobial resistant crisis?

00:02:44:08 - 00:03:11:14

Sanjay Patel

Yeah, I think, one of the main aspects of this is that children, including the minutes, are often forgotten when we have conversations about and about antimicrobial resistance. There's a there's a perception that it's more of a problem in adults, especially in a frail, an elderly, there's also, when interventions are thought of, people tend to focus on adult interventions.

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Sanjay Patel

Our experiences within hospitals is that even the provision of antimicrobial pharmacists, that that service is often mainly focused on adults. So part of this is just making people recognize that resistance happens in children. Rates of resistance are generally very similar in adults and children, to be honest. And then think about specific groups within children who are at the highest risk of invasive infections, because those are the ones where you get a conversion from colonization.

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Sanjay Patel

So we can all be colonized with respect to we at all. And occasionally those resistant organisms. But the the children, we're worried about most of those ones in which we convert from colonization to invasive infection, because that's where the mortality and morbidity comes in. And then it's for very much into that group.

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Clare

And that they, sort of neonates, they more susceptible because of their weakened immune systems that make them more susceptible.

00:04:10:23 - 00:04:35:08

Sanjay Patel

So firstly, they acquire the bottom floor of their mother. So as we say, more and more people, rates of resistance increasing generally across the population, because that's what's always going to happen with bacteria when they're exposed to antibiotics. The, the knock on will be that babies who are born vaginally or by caesarean section, but especially vaginally, will acquire that by flow of their mother.

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Sanjay Patel

And babies are born by the infection, they'll potentially be breastfed, etc. so they'll take on that by a floor and, the issue with nanites is partly to do with their immune system. But for those babies, especially premature babies who are many units, they have so many indwelling devices they can be they could be intubated, they can have long lines in which might be an umbilical artery line.

00:04:59:20 - 00:05:32:07

Sanjay Patel

It might be a, umbilical vein line, might be a long line, might be a chest strain. But all of those in conjunction with their skin, in conjunction with the fact that they can then incubator in a very moist environment, there's handling, there's a risk of acquiring infections from other babies. All of those put them at not only high risk of colonization, but that conversion from colonization to invasive diseases is almost higher in neonates than it is in pretty much any other age group.

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Sanjay Patel

Bath are very small and elderly.

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Clare

Quite often, like you mentioned, people think go immediately to the frail and elderly people with reduced in these systems. Why do you think, neonates, children aren't necessarily as readily considered in this conversation?

00:05:50:11 - 00:06:14:02

Sanjay Patel

That's a really good question, Karen. It's it's, I think it's it reflects the whole of our attitude to services for children and young people. I think that when you look at where the spend at the NHS goes for the majority of adults, the elderly and so, so many of our initiatives, one of the aims is to try and reduce spending, to bring about efficiencies, focus on the silent outlay.

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Sanjay Patel

So I think that, you know, that that's not just an issue. I mean, that's an issue that many aspects of, of of health care delivery. But I think with in this situation, one of the real worries about, about asthma and exposure to antibiotics is it can have long term effects. So the impact of antibiotics is not just resistance.

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Sanjay Patel

It's it's also it can impact on their microbiome. So where we have more bacteria without within our bodies in human cells. So if you expose a neonatal to antibiotics and you also their microbiome, you're potentially having long or lifelong effects on susceptibility to evolution of chronic conditions like asthma are the a topic conditions obesity. And so there was a very strong

narrative that goes even beyond antimicrobial resistance in terms of why we should use antibiotic.

00:07:05:09 - 00:07:11:10

Sanjay Patel

It's more sensitive than marinates and try to minimize their exposure to antibiotics, especially broad spectrum antibiotics.

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Clare

I hadn't considered it like that at all. That's quite worrying to sort of here. Because I suppose that even if you're thinking about kind of cost effectiveness, exposing these, to children, neonates, like you said, having these sort of long term health issues, it's ultimately going to cost the NHS more in the long run. So it's a shame that it's kind of not being thought about as much, I suppose, from the from the get go.

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Sanjay Patel

Yeah. I think unfortunately that's how politics works. You know, political cycles. The fact is, if the impact of your intervention is going to take 20 or 30 years, then, it often gets pushed slower down the to do list when it comes to funding. So I think that, there is an issue with funding, but but I think we are all increasingly recognizing that we're seeing more and more in children.

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Sanjay Patel

And I think that is focusing the minds of clinicians, on hospitals. And UK saying, you know, in the most recent National Action Plan, 2024 to 2029, there's a it's a very well written inequality section and a recognition that age is a potential, source of inequality and that we do need to redress that balance.

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Clare

We talked about maybe how this might as well have been neglected. How do you think, in the way that AMR is communicated could change for the better to include these groups that aren't necessarily usually represented in the conversation?

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Sanjay Patel

That's a really good question. I think advocacy is a part of it. I think people need to recognize this is a problem. I think, so I think there is an emotive aspect of neonates with AMR, especially if they're, resulting in mortality and morbidity. I think we do need to think how we convey that narrative, bringing the emotion into it.

00:09:04:02 - 00:09:29:13

Sanjay Patel

And we can, you know, parents, etc. are, really important advocates for getting this message across to the people that fund healthcare services. And I think we, as the deliveries of health care need to reflect on what approaches we're taking to slam our mandates and really take a long look at on the natal units, you know, mandates and managed up and down the country.

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Sanjay Patel

And, and many hospitals have little three neonatal units where on on those premature babies and managed well. I think that the current antimicrobial stewardship and IPC offer within those neonatal units varies hugely. And I think that's where we need some concerted work. We need to really benchmark what is being done on those units. We need access to better data in terms of resistance rates in those units, in terms of antimicrobial prescribing within those units.

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Sanjay Patel

And then we need to share good practice. We need to benchmark. But I think a lot of this needs to be data driven. And although we're awash with data, we're still relatively poor using that data. And so I feel quite strongly that we need to use data in order to, work with our colleagues and their nature units to highlight the size of the problem and work with them to try and find strategies to tackle it.

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Sanjay Patel

And I think that approach will differ. Effort units, you know, I don't think there is a one size fits all approach to, how we improve antimicrobial stewardship, say, on an acre unit. But that's what we need to work on. And I think that's where we need to work. We need infection specialist. I'd Clinicians Microbiology is working with neonatologist with matrons on those neonatal units, with people that had access to data with our IPC colleagues, with our pharmacy colleagues.

00:10:51:21 - 00:10:54:13

Sanjay Patel

And that's we need to do this collaboratively.

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Clare

So one of the interventions that can tackle this problem of sort of antimicrobial resistance in neonates is, is antimicrobial intravenous to oral switch. Could you tell me about that? Seems really interesting.

00:11:09:15 - 00:11:32:16

Sanjay Patel

Us is really good question. So I mean across across the whole of infection management. So let's not focus on children for a moment. There's been a recognition that, we have an obsession with IV antibiotics. There's been this perception that idea is best. And that's been challenged through a lot of randomized controlled trials for bone and joints infections and Itis and compiling a practice.

00:11:32:16 - 00:11:53:16

Sanjay Patel

And you can almost name any pathology. And there is more and more evidence that some of your guts working, and you've got an oral agent that that covers the organism that you're trying to cover. Well, then, actually, all this is good, as I'd say, but one of those areas where we've been very reluctant to move to oral antibiotics early is minutes.

00:11:53:16 - 00:12:15:14

Sanjay Patel

So babies can get sepsis if it's in the first seven, two hours of life. We call that early onset sepsis. If it's between 72 hours and three months of life, we call it late onset sepsis. But we've been relatively reluctant, especially for early onset sepsis, to ever consider an oral switch. It would just be you've got to get the course of antibiotic switch to culture negative.

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Sanjay Patel

Convincing late onset sepsis would be five days. And if it was gram negative sepsis, it might be seven days. But there's now data coming out of, out of a study from Holland or the rain study and a similar study and asked done, by colleagues in Denmark suggesting that an oral switch, has the same outcomes even for children with confirmed bacteremia with organisms such as Group B strep and E coli.

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Sanjay Patel

We're not talking meningitis. And meningitis is still, you know, given the antibiotics, but there's a move towards oral antibiotics. And I think that that's just a very interesting discussion. We're watching that closely. In the UK, a couple of centers have moved towards switching the NHS to orals, but it's still a bit of watchful waiting for other places to to try and see what happens.

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Sanjay Patel

But I think that would be great. I think IV antibiotics, they come with their own risks, the cannula, the impact on the family, babies having to come. More children are going to come back each day to hospital, potentially the cost of that, you know, the emotional toll of that for the family and the child. So if we can manage them with all antibiotics with the same outcomes, I'm all for it.

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Clare

Yeah, definitely. And again, I guess that would be a kind of situation where data is going to be king and it is going to be keeping an eye out to see the changes. Whether those make changes, make the difference you're expecting.

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Sanjay Patel

Yeah, absolutely. I mean, the good thing is that some of those studies have been done. So we've it's often quite difficult to recruit into into studies for children who just, you know, especially parents accepting to consent to such studies. But our colleagues, as I said, in Holland and Denmark, they've done that. They've done some, you know, conducted two very nice studies.

00:14:01:04 - 00:14:18:03

Sanjay Patel

And I think that we now need to see how people are, you know, interpreting that in the UK. There's no, no reason why babies in the UK should be any different from those babies in Holland and Denmark. But, you're right. We just need to share good practice in this country.

00:14:18:05 - 00:14:32:20

Clare

The people are listening to this can come from more microbiology, traditional research backgrounds. But also we do have so clinicians and things you listen to this podcast. Are there any other practices that you're looking to add towards to kind of tackle this this problem.

00:14:32:22 - 00:15:00:17

Sanjay Patel

Yeah I a firstly we have a really good national network for pediatric antimicrobial stewardship. It's called UK pass. And anyone can join that can be clinicians researchers you know any of the people listening to this podcast have a look at the basic is bicep supported national pediatric EMS network. And within it we have a neonatal workstream, chaired by a colleague from the equity in the children's hospital.

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Sanjay Patel

In terms of neonatal specifically, there was certain scoring systems. So Kaiser Permanente is one where we if that's implemented effectively, you can drop your rates of prescribing a newborn babies from a parent. What the depending on where your current baseline is 10 to 12% down to 6 to 7%. So that's a huge impact. You know there's discussions about the role of points of care tests.

00:15:24:12 - 00:15:45:04

Sanjay Patel

There's discussions about blood cultures. There's discussions about CRP trends, all sorts I it all switches as you said. So those that we're looking at many things in the NHS. But I do think one of the first places to start is implementing an early onset sepsis scoring system such as Kaiser Permanente. If you haven't done so in your unit.

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Clare

And I suppose that's kind of on the sort of more closely micro, but on that perhaps more smaller scale on like patient to clinician and but in terms of like the larger scale, talking about policy and

communications and that kind of thing. Are there any changes that you'd like to see kind of in the bigger picture in being able to begin to tackle this problem and consider this group of people specifically?

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Sanjay Patel

Yeah. I think, for the policy perspective, I think we need to recognize that antimicrobial stewardship is an important thing to support and fund. And so from a clinical perspective, that requires clinicians to do that work, and those clinicians will be infection specialists. It will be a combination of, infectious diseases specialist and pediatric infectious diseases specialists and microbiologists, pharmacists, nurses, you know, your your core group to, to support antimicrobial stewardship.

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Sanjay Patel

I think there is a difference between the place that those individuals tend to work, which is Children's Hospital and DHS. So I think we need to think about how we can share good practice from children's hospitals into DHS. And I think that's where networks come in. I think we've really got to promote a more robust network model where we, look at a map of the country, look at we look at where all of our children's hospitals are.

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Sanjay Patel

We look at where all of our is, are we kind of divided up so that if is aligned in a robust way to a children's hospital, and that way we can cascade knowledge, we can create communities of practice. And I think that's how we're going to change practice. And pediatrics. And then it's and then I think in our most complicated medical units, our level three units will be to set up these more robust systems, where we use data more effectively.

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Sanjay Patel

And we really scrutinize that data proactively in terms of resistance rates, in terms of antimicrobial prescribing, in terms of some of those adverse effects of antibiotics such as necrotizing intra colitis and invasive fungal infections, nosocomial infections. And we we have a data driven process for trying to tackle and recognize antimicrobial resistance trends and tackling them.

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Clare

And just as that District General Hospital.

00:18:11:10 - 00:18:38:23

Sanjay Patel

It is, is a district General hospital. Yeah. So that's where the majority of children in this country will be managed. So for every ten district general hospitals approximately there'll be one children's hospital. So children's hospital serves a region and it provides expert support, to a number of district general hospitals. And within that children's hospital, there should be a pediatric infectious diseases service.

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Clare

And in talking about again that come back comes back to data. And then at this point in time, say for example, a particular hospital is gathering data on antimicrobial resistance in their patients at this point in time. Is that data shared with other hospitals, where does it go? Is it just local? Do you know?

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Sanjay Patel

Yes, a really good question. I think the answer is it's generally not necessarily collected. And if it is, it's quite often not shared. I mean UK HSA collects data on resistance, but that isn't specifically split into adults and children. So numerically adults are obviously going to outweigh children numerically. And so it's very hard to extract out the pediatric or specifically mandated.

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Sanjay Patel

I said, everything currently a platform or a program for sharing rates of resistance amongst neonates and different neonatal units, say, however, that's something we would like to grow to. And that's what UK has, as a national organization can potentially help with that. And I do think that these networks, I mean, my vision would be that this aims pediatric antimicrobial stewardship networks across England, and then at least data from those DGS can be shared.

00:19:58:13 - 00:20:20:11

Sanjay Patel

The benchmarking and then all of those networks can come together to share data. So I think at the moment we don't do it that well. And I think we need to find better systems to doing it. But one of the other issues is that sometimes access to that prescribing data is not necessarily straightforward. You know, if you don't have electronic prescribing, then doing that manually is is challenging.

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Clare

So I can kind of see then why potentially that as well. That's one aspect of why this conversation isn't at the forefront. If even you don't have the data to support what you're saying, it must be quite frustrating to not be able to actively point and say, like, look, this is why it's this is a massive problem.

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Clare

Here's the numbers for it. So do you find yourself then when in your position and in the work you do, are do you find yourself more leaning towards the sort of personal stories, your experiences in kind of those kind of comms that you do?

00:20:53:13 - 00:21:16:19

Sanjay Patel

I think a bit of both, actually. I think there's actually very robust data about conversion. Can colonization to infection, invasive disease and mandates. So that's in the aspire reports from last year. I think we also lead on those emotive stories. I think the observation of clinical colleagues, you I mean, it's ologist, as I say, more and more resistance.

00:21:16:21 - 00:21:38:06

Sanjay Patel

And I think we, we then collect our local data to help that narrative. So those of us that can access resistance data locally will then use that to try and frame the narrative. I mean, it would be we are trying to collate European wide data. So through the Ecdc it would be really good to have pediatric age band data on resistance.

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Sanjay Patel

But we so far have struggled to obtain that data. But that would be a much more powerful narrative when you've actually got the real numbers and across Europe to try and back up this narrative.

00:21:51:15 - 00:21:59:13

Clare

Is there anything that our membership can do to support or change or kind of help with this problem at all.

00:21:59:18 - 00:22:22:05

Sanjay Patel

Yeah, I think I think it comes back to the data. So I think any way that we can facilitate access to resistance data, and a recognition that pulling that data on mandates in your unit can help that narrative, I think, would be really powerful. So I think the data is really important. I think, you need to be proactive in it.

00:22:22:05 - 00:22:46:22

Sanjay Patel

And I think your members need to be actively engaged in this process. They need to recognize that labor is a problem. It's, you know, some lovely data from, from India that shows that, the NHS infected with resistant organisms, resistant gram negative, have a higher mortality than those infected with non resistant organisms. So it's having a real impact on babies in this country.

00:22:46:24 - 00:23:01:02

Sanjay Patel

To try and address it we need a data driven approach. So if your members have access to data actually scrutinize those data and potentially start those conversations with an intelligence unit.

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Clare

It's positive to get, something that you can actually do and something that you can actually take from this. It's really good to hear that from you. Thank you so much for joining me. It's been a pleasure to go through, and talk about it's really important. Important subject.

00:23:14:22 - 00:23:19:12

Sanjay Patel

Yeah. Pleasure. Absolutely. My absolute pleasure.

00:23:19:14 - 00:23:50:02

Clare

Thanks again to Sanjay for his valuable insights into an often overlooked group. Well, it might be disheartening to hear the vulnerable are being affected by AMR. It's promising to hear the positive stories of how collaboration and innovation can start to tackle the problem. If listening to this podcast has inspired you to take action, you can find the resources Sanjay mentioned and details of how you can take part in the society's Knocking Out AMR project in the description.

00:23:50:04 - 00:24:03:19

Clare

Thank you for listening to Microbe Talk. If you like this episode, please leave a like or a comment wherever you're listening.