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Hello, I am Dr Diane Cottell, a clinical editor at BMJ Learning. Welcome to this series of five modules on common problems in childhood. In this fifth episode we discuss conditions related to the skin.

Here to talk to us is Dr Ian McConne, consultant in general paediatrics at Birmingham Children’s Hospital and Deputy Editor of the journal Archives of Disease in Childhood. Hello Ian, thanks for joining us.

Hello, again.

In this audio module we are going to look at common skin conditions in children. Is there anything general that we can say about these? Is there a structure that we can look at to try and categorise them in a way that makes it simple for clinicians to diagnose and manage them?
Ian: Well, Diane, I think one of the difficult things with this is that it is relatively difficult to do on podcast. I think what I would probably advise the listeners to do is have a look at some of these lesions and hit your preferred search engine and try and look for some of these lesions. This is a very visual part of medicine, it is quite difficult to describe in words.

But for example, we could talk about lesions that are filled with fluid. We could talk about lesions that are raised. We can talk about what they do when you press on them and things like that. We could go through that sort of structure, if you like.

Diane: Okay. So firstly, let’s look at fluid filled lesions. What are the most common causes of these and how can you differentiate between them?

Ian: So, fluid filled lesions or vascular lesions, usually you would be thinking about infectious processes. So clear fluid, you would be thinking about things like chickenpox or herpes simplex as a small lesion. Larger lesions, you would be thinking about lesions like an impetigo, or if the lesion is further spread, you would be thinking about cross over from an impetigo even into a Stevens-Johnson toxic epidermal necrolysis sort of situation.

I would imagine that most people in primary care will be more familiar with chickenpox than I am because generally speaking, I only get to see chickenpox when they are severe secondary complications. So for example, secondary infection. So the chickenpox itself actually opens up the skin, secondary bacterial infection and the child gets more unwell. Or I deal with one of the multiple complications of chickenpox, for example, varicella cerebritis or other secondary infections, sort of pictures.
Diane: So, in those conditions you have just mentioned, would you ever consider investigating children with any of these? What investigations would you do?

Ian: Let’s just focus on chickenpox and what worries me about chickenpox. Because, for example, a child with chickenpox, they are fairly miserable. They have had some sort of exposure to chickenpox in the preceding few weeks. It has got an incubation period of about 21 days. They develop the chickenpox, they become unwell and then they potentially get better.

The situation that keeps paediatricians awake at night is when they develop a serious secondary infection. So they have deffervesced 0:02:53, and then they start developing fever again about day four or day five of the illness. What we are really worried about there is some form of strep infection, secondary to that.

So if I were investigating that child, what I would be saying would be, “Okay, I’m worried there about sepsis.” So I would put that child through a full or partial sepsis screen. I would be doing the full blood count, Us & Es etc, looking for blood culture. Consideration of other further investigations for sepsis if necessary, depending on the clinical circumstances.

So things like herpes simplex, again, I would not necessarily regard that as being necessary to massively investigate that. The situation that that, for me, would present within secondary care is when these children have got a horrible crusted infection around their mouth. They have stopped drinking. Under those circumstances I would be saying, “Has this child got themselves in trouble?” I have seen children who have put their urea up into the teens because they simply won’t drink because their mouth is so sore.

Impetigo itself, I would not ordinarily investigate that either. So again, only as indicated by the clinical circumstances. Almost always going
to be caused by staph aureus. You know it is caused by staph aureus because it goes a nice golden colour, that's why staph aureus is called the aureus, isn't it? I would not ordinarily investigate that.

Diane: So for conditions like Steven-Johnson syndrome, which you mentioned, toxic epidermal necrolysis, those are children that should be referred to secondary care?

Ian: Emphatically, yes. They are terrifying, TEN, toxic epidermal necrolysis, is a very scary condition. These are children who end up in intensive care, primarily for airway and pain management. It's a terribly, terribly painful condition.

Diane: But for children with chickenpox, impetigo and herpes simplex viral infections, those children can be managed in primary care. What sort of things can the GPs be doing?

Ian: Yes, absolutely, they can. Usually the main difficulty with chickenpox is that it is an irritating rash. So basically, kids hate it. What is interesting is that there is still a widespread belief that calamine lotion is useful. It certainly is useful for lining the pockets of the people who sell it. But there is probably no evidence that it improves the itch of rash in chickenpox. Really it is just symptomatic treatment if you can. These children get quite miserable. Usual basic medical nursing care. So frequent cuddles, keep them comfortable, keep them nice and wrapped up as necessary.

Diane: Okay. So let's move onto papular rashes. What are the common causes of these types of rashes?
Ian: Papular rashes are raised rashes. So as you run your hand over it, you are going to feel a bump in the skin. The things that I think of there, and these are broadly all would classify under a papular sort of rash, but you think of things like an urticaria, which would be an itchy raised rash. You would think of something like molluscum contagiosum, which is almost ubiquitous. I think if you probably look carefully enough at enough children, you can probably find one molluscum contagiosum on every child. They are very tiny circular, probably a couple of millimetres across. They have got a little tiny umbilicus in the middle.

There are things like scabies, where... Well I am sure you can diagnose scabies. It’s a very itchy rash and you have got S shaped burrows that you need to get down there with your magnifying glass and have a good old look at them. Other things like insect bites and the like, can give you a raised rash as well.

Diane: Okay. So when would you ever consider investigating these children?

Ian: The urticaria, you would not necessarily throw investigations at, but it might take you down an allergies route. So for example, a child who develops urticaria after they have had some sort of exposure to egg or a peanut or whatever. That might make you worry that they have got an allergy. But I certainly would not throw investigations at them, I would be assessing that carefully.

Diane: What about managing children with urticaria?

Ian: What I would be attempting to do would be to switch off the process that is causing the urticaria. So if I thought that was an allergic
phenomenon, I would be giving them a histamine antagonist. So something like Chlorphenamine, this would interrupt that. Obviously if that is associated with other features of anaphylaxis, then you would need to add in adrenaline of epinephrine so you would be giving them usually an injection of intra-muscular epinephrine.

Diane: So we have talked about urticaria, let's move on to talk about allergy.

Ian: Okay.

Diane: So say we see a one year old boy who has developed an urtacaria rash after eating egg.

Ian: Okay. So that's egg allergy. There is a lot of stuff you can read about being very precise about diagnosing egg allergy or avoiding the diagnosis of egg allergy. But in those circumstances you have got a clear history of exposure and then the development of the allergic features, then that is allergy until proven otherwise. So what I would do under those circumstances is I would probably not do a whole bunch of investigations. I would basically take a pragmatic approach that if that child has had an apparent allergic reaction, I would probably restrict that in their diet.

Now egg allergy itself is most likely to get better. Of all the allergies, if you had to choose an allergy to have, I would have egg allergy because you are most likely to grow out of it by the time you are five. There is about a 95% chance. By comparison, nut allergy, there is only about a 5% chance of growing out of it by the time you are five.

The decisions that you have to make are how robust you are going to be about restricting the diet. Are you going to investigate any further? If you are going to investigate, what further investigations are you
going to do? Are you going to give medicines to alter the course of the allergy, if it happens again?

So I think that one of the things that I try to do is work out well, if I have got a family in front of me who are absolutely convinced that the egg was the thing that caused the urticaria. I can do a million and one tests and they are still not going to believe, if I tell them the tests are negative, they are still not going to believe that that child is not allergic. So under those circumstances, restriction of your diet and missing out on egg is not going to be profoundly harmful if that is the only thing you are missing out on.

Obviously if the child is on a massively restricted diet, because their parents believe they can only cope with white rice and lentils, then that is a different situation. But actually, you have got to choose your battles, haven’t you? So under those circumstances I would take a pragmatic approach. Yes, that is fine, let’s just restrict egg.

Now the decision about the further testing would be trying to look at whether that genuinely supports that the child has an allergy and whether it is a useful thing to monitor the allergy. So if I see a child, let’s say they are five years old, they have had an allergic reaction to peanuts. They are testing, so that could be a RAST test or a skin prick test, it is positive. That is helpful. That tells me that five years down the line, if that is then negative, that might tell me something about the progress of the allergy.

It does not tell me anything really about today, because it could also come back as negative. If it comes back as negative, they still probably have got the allergy; it just tells me the test is not very good. It then gives me an answer for five years time that it is not worth ever bothering doing that test again.

In terms of the treatment, basically it is about histamine antagonists and it is about use of adrenalin or epinephrine. The histamine antagonists, something like Chlorphenamine is a very safe medicine and families should be given access to that if their child is having an allergic reaction or has had regular allergic reactions. The injected
intra-muscular adrenalin, or epinephrine, that should be reserved for children who have had collapse, who have had genuine anaphylaxia. So collapse or have had significant breathing difficulties or gastrointestinal problems, so a lot of vomiting following ingestion of some item.

The challenge around that is that of course, if you are going to have injected adrenalin, you then need to make sure you are not more than two minutes away from it, ever. That is a challenge for parents because you have got to make sure there is one in school or in nursery. That is they go regularly to Nan’s you make sure that the medicine goes with them to their Nan’s. Or you have got to make sure that they are always not more than two minutes away. Because the function of the injection is to buy you time while an ambulance is arriving.

Diane: Okay. So we have just had a discussion about allergy. Moving on from that to discuss ATP in general. What about the child who presents, for example, with eczema?

Ian: Okay.

Diane: A nine year old girl comes in, her mother says that her eczema has flared up; she has got areas of excoriation in her flextures. She is on emollients, no steroids at the moment. What things would you be asking her mother in the history and examination that would inform your management?

Ian: Well a nine year old girl, I would be talking to her as well, of course.
Diane: Of course.

Ian: I think it is really about, “What has brought this on?” Is there some sort of super, I don’t know, infection? Is there some sort of exposure? Is there some sort of change in the environment that has resulted in this? So for example, have they changed washing powder? Have they changed the clothing she is wearing? Is there different stresses at home or whatever?

If she has got a significant flare, then just being on emollients doesn’t seem enough. I think the really important thing, the central message for me around eczema is that the emollients that you put on by the fistful, whereas with the steroids you put on sparingly. My colleagues in Birmingham talk about a fingertip unit. Which is, as I understand it, is basically, if you imagine squeezing a piece of toothpaste, from the tip of your nail around to your proximal interphalangeal joint, so basically, the end of your finger, like a squidge of toothpaste. They call that one fingertip unit.

As I understand it, I think it is one or two fingertip units per area of the palm of the hand. So quite sparingly, but not too sparingly. If the child has got a significant flare up, I am going to be trying to work out, do they need some steroids. Also, is there some sort of secondary infection that might benefit from being treated with antibiotics?

Diane: Okay. So let’s move on to the rashes that cause a lot of GPs and secondary care physicians concern. The purpuric rashes and petechiae.

Ian: Okay, the scary rashes.

Diane: Yes. The scary rashes. So, let’s take a case example. You see a
seven year old girl; she is brought in by her mother because she is unresponsive. Her mother noted that she had a temperature that morning, she sent her to school and when she came home she had one spot on her knee that her mother said didn’t disappear when she pressed a glass on it. What are you looking for in the history and examination with that sort of child?

Ian: Okay. Did you tell me she was unresponsive?

Diane: She was unresponsive.

Ian: Okay. 999. So this is a child who needs to be in some sort of healthcare facility where we can deliver airway breathing, circulation, ventilate this child and manage them. Because I think what you are trying to hint to me is that they might have meningococcemia. As you know, petechiae are small purpura, if you like. So a purpura of one to two millimetres is a petechia and when it gets bigger it is a purpura.

So, broadly speaking, there are a couple of situations which give you petechiae. One situation is coughing. So if you manage to raise your pressures enough with coughing, then you can get petechiae. A particular situation that that happens in is, you see it in whooping cough, where children have got an appalling cough. They come in and it looks like they have got eye shadow in underneath their eyes. They have got all these little marks. When you look closer, they have got all these little petechiae below their lower lid. That is a classic situation that lots of listeners have seen.

The petechiae that are caused by cough are usually in the distribution of the superior vena cava, just because of the nature of the anatomy. Petechiae that are outside, if you examine the children very, very carefully, you can often find one thing that might be a petechia and that is where it gets tricky. That is where I have got this massive
advantage.

I work at a multi million pound hospital with hundreds of fabulous nurses who I can call on 24 hours a day to observe children. I think that that makes it quite a lot more difficult in primary care. Because what you don’t know, obviously, when you are looking at the child is, is this the first petechia of many that is going to develop into purpura? Or is this actually just one of those things that you have been a bit too careful about examining the child, and it turns out that you have just got one petechia.

I think there is a lot of excellent advice about this. Certainly the Meningitis Foundation has got some really good stuff online which you should look at. But, if you are in any doubt, then you should ship them into hospital. If you genuinely think that they have got meningitis or meningococcemia, then you should give them a dose of antibiotics, there and then before shipping them in. Then we can manage them.

The challenge then in hospital is to try to work out, “Okay, is this just a child with a single petechia that isn’t going to get any worse? Or are they a child who is on the cusp of a very catastrophic illness?” Under those circumstances it takes quite a lot of willpower and quite a lot of frequent observation to decide whether you are going to go down a route of putting the child on antibiotics and just checking to see if they are getting worse. Or, in some situations where you are completely convinced that this is just a single isolated petechia, just observing the child, rather than starting them on antibiotics.

But that takes the resources that you have in secondary care behind you, to be able to make those sort of decisions. I would do things like, for example, a paired CRP 18 or 24 hours apart. If they are both below ten, then that tells me the child isn’t fighting an infection, they don’t seem to be getting worse. I would be examining the child regularly. I would also have them well observed by good nurses and that gives me the confidence to say I don’t need to rush in and give antibiotics in this child.

It becomes a little bit trickier when the child has been given parenteral
antibiotics in the community. But that’s great, that is a problem I am delighted to manage because it is much more worrying when a child has had a delayed treatment of their meningococcemia or their meningitis out in the community. It is one of those nice complications of medicine where, you know what, this is a bit muddy, and it is a bit difficult to work out what is going on. But actually it is so much better than the other scenario.

Diane: Okay. So we have discussed the cause of purpura that causes the most people concern, which is meningococcal septicaemia. What about other causes of purpura?

Ian: Okay. There are a couple of situations where you might have a rash that you might describe as purpura. So for example, Henoch-Schoenlein purpura, kind of, the clue is in the name. So basically in Henoch-Schoenlein purpura what happens is that you develop a, usually, painless rash, usually over the buttocks and the legs. It doesn’t spread any further, the child is relatively well. Unless they have got other associated symptoms, for example, like a joint pain or abdominal pain. They are usually significantly distinctive.

If you have seen a child with meningococcemia, they are very unwell. A child with Henoch-Schoenlein purpura is usually a lot better, a lot more active. They usually won’t sit still and let you examine them.

Then there are other reasons why you might just simply bleed. So if you don’t have enough platelets, for example, you have idiopathic thrombocytopenic purpura or if you have got absence of platelets because you have got a leukaemia and your marrow has been completely crowded out. Those are other possible reasons. Certainly, in your assessment of a child presenting with purpura, you are going to have done a full blood count. You are going to be looking, in secondary care, for other causes of that.

The other thing that we ought to be talking about whenever we are
talking about children with any kind of bruising appearances, we ought to talk about trauma. We can talk about that as accidental trauma and non accidental trauma. Now, of course, non accidental trauma is an entirely other and very large subject, but it is very important to overlap that here.

So if you see a child with purpura that is secondary to perhaps being pinched or grasped by another person in a way that is not consummate with normal love care, then that is an important thing to register and behave appropriately about. Basically, ask for some advice.

Diane: So, for these other conditions that cause purpura, for example, Henoch-Schonlein purpura that you just discussed, would you consider investigations for any of these?

Ian: I think you probably ought to do a full blood count so that you know that what you are dealing with. The haematologist is going to have a look in ITP at, what does that film look like? Is there anything that suggests that there is anything else abnormal going on? For example, something that suggests leukaemia or... Obviously if it comes back with peripheral blasts, then that is going to be a bit more complex.

Diane: How can the GP manage these in primary care?

Ian: In terms of management within primary care, I think it is being alert to the diagnosis. I think you are probably going to need some help with that diagnosis by referring into secondary care.

Diane: So let’s move onto viral exanthems now. What things would you be
thinking about in terms of causes for children that present with viral exanthems?

Ian: Well again, this is where you have the advantage over me. So in secondary care I really don’t get to see that much by way of viral exanthems. I mean, I can list some of them. But basically, there is a whole bunch of illnesses that present in subtly different ways which give you red rashes. So for example, there are things like roseola, there is human herpes virus, and there is HHV 6 and 7 which can cause illnesses. There is erythema infectiosum which is sometimes called Fifth disease or slapped cheek disease. That is part of a virus B19.

So there is measles and there is rubella, which I sometimes refer to as German measles. As you will have seen in any textbook of paediatrics or primary care, they have got certain ways of presenting.

Diane: So, for the exanthems, in children who have exanthems, what sort of investigations would you ever consider?

Ian: I would only consider investigations if I thought that I might have my diagnosis wrong. So for example, if I saw a child who had a very red rash, perhaps mostly confined to the mucous membranes or on the palms of the hands and the soles of the feet. There was some lymphadenopathy or whatever, so I was worried about something like Kawasaki disease. Then I would think about, “Right, this child needs some sort of much more detailed assessment.” Kawasaki disease usually won’t get better by itself, it would need actual treatment. In fact treatment is associated with improved prognosis.

Diane: Just a little bit more about Kawasaki disease. How would that typically
Ian: Kawasaki disease is one of these diseases that is in search of an etiology. So nobody knows what precisely causes it, but it is a prolonged unremitting fever. That is a mandatory feature and then there is five other features which include things like conjunctivitis, cervical lymphadenopathy, strawberry tongue, red mucous membranes etc. These add to the diagnosis and obviously just to make things more complicated; some children can get partial Kawasaki disease.

These children are miserable. They are some of the most miserable children that you would look after. So I can almost tell when I walk onto a ward that there is a child with Kawasaki disease or certainly as I walk into the room. They are very, very angry and upset children.

What they need is rapid diagnosis, which is difficult because they are one of these diseases that you make on the basis of a number of different clinical features, rather than there being a specific test. But there is evidence that the earlier you get the treatment running, the more likely you are to be able to prevent the particular complication that we are worried about, which is coronary artery aneurysms.

Diane: So what sort of investigations do these children need?

Ian: In primary care?

Diane: Yes.

Ian: They need referring into secondary care because they are going to
need intravenous immunoglobulins. In secondary care I would be worried about sepsis because it is a difficult diagnosis to get to. They almost always have very raised platelets when you do a full blood count. I would probably end up doing a partial sepsis screen on these children. So I would be looking at the rest of the full blood count. I would be doing blood cultures and the like.

As part of the management, depending on local protocols, these children get echocardiography with a particular view of looking at their coronary artery aneurysms, usually while they are an inpatient. Then follow up echocardiography after six to eight weeks. But again, that depends on local guidelines.

Diane: So for children with other viral exanthems that you have mentioned, scarlet fever, roseola. How can they be managed in primary care?

Ian: I think basically, symptomatically. There will be exclusion periods from school or nurseries, but other than that I would manage it symptomatically. What your mum did. Wrap you up in plenty of fluids; make you comfortable for a few days.

Diane: So any final comments about children with skin conditions or take home messages for GPs?

Ian: I think that if you are concerned, then asking for a further opinion is definitely necessary. I think in the purpuric rashes, they are very scary and I think that it is reasonable to behave in a robust manner and get them up to a facility where they can be dealt with definitively. Other than that, I would say we need to be thinking about non accidental problems as well. So, those just have to be in the back of your mind as well.
Diane: Many thanks to Dr Ian McCon. For other episodes in the series, and further useful resources, follow the links on the next page.

Male: Thank you for listening to this audio module from BMJ Learning.

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