DFASM3 – FollowUp 03 *Malaria* Transcript

Based on *http://www.samaritanid.com/archive_dynamic.php?caseID=33*

Dr. DANA POTTER, chief resident at Johns Hopkins, is tutoring Dr. GREGORY SNEIDER, an intern.

DANA POTTER: Hello Greg, are you ready for a new case?

GREGORY SNEIDER: Yes, thank you again so much for helping me.

DANA POTTER: Not at all, it helps me review for my **boards** too. So today we are talking about Mrs Williams, a 41-year old female. She was admitted to the hospital for high fever and **chills**. What would you ask the patient?

GREGORY SNEIDER: That's all she's complaining of?

DANA POTTER: At that time, yes.

GREGORY SNEIDER: I would ask her if she's **pregnant**.

DANA POTTER: Ok, fine – she wasn't pregnant. What else?

GREGORY SNEIDER: Well when you say high fever and chills, I'm thinking infection. So I would ask if she had any recent **surgery** or **wound** that might have gotten infected.

DANA POTTER: Nothing of the sort.

GREGORY SNEIDER: Ok, then I'd **press her to know** if she has any more symptoms, like pain anywhere, or any sign of upper respiratory distress, or any **GI** problems.

DANA POTTER: Then she would tell you she had abdominal cramping 5 days prior to presentation, and in the previous three days she had nausea and vomiting.

GREGORY SNEIDER: Ok – so I'd ask her if anyone she knows has the same symptoms and if there's a chance she ate something **funky** just before the **onset** of her symptoms.

DANA POTTER: She lives alone and hadn't gone to work as she had been on vacation for a month so she hadn't really seen anybody. Nobody she knew had the same symptoms. She doesn't remember eating anything out of the ordinary before the onset of symptoms.

GREGORY SNEIDER: Wait, she was on vacation? Had she had contact with animals or gone travelling?

DANA POTTER: Aha, there you go. Yes, she had returned from a one month-long stay in Uganda three days before presentation. But she reported no contact with animals.

GREGORY SNEIDER: Ah ok and was she from the U.S. originally?

DANA POTTER: Yes, why do you ask?

GREGORY SNEIDER: Because it is my understanding that some people in some parts of the world have natural resistance to tropical diseases – like **waterborne** diseases in India I think – so I thought it might be useful information.

DANA POTTER: Ok, interesting. Well she was a native-born U.S. citizen but she had been regularly visiting Uganda for several years for two to four-week-long stays as a Christian missionary.

GREGORY SNEIDER: Alright and when had her symptoms begun?

DANA POTTER: You really should have asked that a little earlier on but they started five days before presentation. She then became ill with fever, malaise, and abdominal cramping – that was two days before departing Uganda. She remained ill on her airplane flight back to the United States. In the three days **prior to** seeking care upon arrival in the U.S. she had continued episodes of high fever with chills and had nausea and vomiting. Now that you have all her symptoms, would you have had any more questions for the patient?

GREGORY SNEIDER: Well, I would have liked to know if she had taken any kind of prophylaxis before going to Uganda.

DANA POTTER: No she hadn't. On some prior visits she had taken antimalarial prophylaxis, on more recent visits, including this one, she had not taken prophylaxis in part because of the **expense**. Which drug would that be – antimalarial prophylaxis and expensive?

GREGORY SNEIDER: It must have been Malarone. But there are others that are **cheaper**… Did she get protection from mosquitoes at all?

DANA POTTER: She did use a mosquito **net** at night and was unaware of any mosquito **bites**. She didn't want to use Lariam, which is cheaper you're right, because she'd had **side effects** with it: **dizziness** and violent **headaches**.

GREGORY SNEIDER: Ah ok, and did she have any **significant underlying medical illnesses**?

DANA POTTER: No. Her history was quite unremarkable. Nothing useful to the case. What would have been your next step?

GREGORY SNEIDER: I would get some tests done, like blood work, a **blood smear** for malaria for sure.

DANA POTTER: At the time of her emergency room presentation, laboratory evaluation included WBC at 3.4, Hgb at 13.9, platelets at 17, AST at 90, ALT at 118, Bilirubin at 4.7, Bicarb 26, Creat at 0.6, INR was 1.1, PTT 30, fibrinogen levels were at 478, and D-Dimer > 5250. A blood smear for malaria was positive showing a high parasitemia (15%). CXR did not show significant abnormality.

GREGORY SNEIDER: So that's almost too easy, we just put her on antimalarial therapy.

DANA POTTER: Yes, but within the first day of hospitalization, she became progressively **obtunded**. What would you do then?

GREGORY SNEIDER: Hu I – I'm not sure, would you **take her off the drugs**?

DANA POTTER: You do have to treat the infection Greg, you cannot just stop treating the patient. In this case, it's not a reaction to the medication, it's a sign of complication so Mrs Williams was transferred to a tertiary care facility for potential exchange transfusion, and continued care of course.

GREGORY SNEIDER: But how could I have known, nobody ever has malaria in the States.

DANA POTTER: Well, yes, malaria *is* rare in the US so few **residents** know about it in depth, which means now you **have a leg up** as compared to the others. Now, do you have any idea what the clinical features of complicated malaria are, as defined by the W.H.O.?

GREGORY SNEIDER: Ah – that's a **tough** one. I did study it but I'm not sure I'll find them all. So, there's **impaired consciousness**, prostration, clinical jaundice plus evidence of other vital organ dysfunction, hu – multiple convulsions?

DANA POTTER: That's correct – more than two episodes in 24 hours.

GREGORY SNEIDER: Let's see, there's **circulatory collapse** or shock – and – I'm not sure.

DANA POTTER: That's quite good, you're just missing abnormal spontaneous bleeding, failure to feed and respiratory distress. How many do you need to have when there is no other obvious cause of symptoms to classify malaria as being a **severe** case?

GREGORY SNEIDER: At least two?

DANA POTTER: At least one. Now, which **species** of parasite is more **likely** to cause severe malaria?

GREGORY SNEIDER: I do know that – I think it's *Plasmodium falciparum or p. knowlesi*

DANA POTTER: Yes, very nice and in this case the patient had severe cerebral malaria due to *Plasmodium falciparum*.

GREGORY SNEIDER: I think I remember that those suffering from severe malaria *should* be treated with parenteral therapy.

DANA POTTER: Now my big question: what would be the most effective pharmaceutical therapy in this case of severe malaria?

GREGORY SNEIDER: Quinidine gluconate?

DANA POTTER: Well, partly yes but not only. But this *was* a **trick question**. Quinidine gluconate is no longer considered the preferred treatment for severe falciparum malaria. It is less **potent** as an antimalarial and has more significant side effects such as cardiotoxicity, hypotension and hypoglycemia than… any idea what would be preferable?

GREGORY SNEIDER: No, sorry.

DANA POTTER: Artesunate!

GREGORY SNEIDER: But I thought I learnt that the only currently commercially available **IV** antimalarial was quinidine gluconate.

DANA POTTER: Yes, you're right.

GREGORY SNEIDER: So, what's artesunate?

DANA POTTER: It's an artemisinin, which is derived from sweet wormwood - Qinghao.

GREGORY SNEIDER: Never heard of it.

DANA POTTER: Well the active ingredient of Qinghao, known as artemisinin, was isolated by Chinese scientists in 1971 so it's quite recent. Its higher **efficacy** in treatment may **be due** in part **to** its activity against more ring form stages than the quinoline antimalarials (like quinine, quinidine, and mefloquine).

GREGORY SNEIDER: Right, but if it's not available in the US, how do we get it for the patient?

DANA POTTER: There is an **investigational new drug** protocol at the **CDC**. Its eventual commercial **availability** is being sought, which to some degree is a financial issue as the costs of drug development and approval are very **substantial**, particularly when there are only about 1500 cases of malaria of all types reported in the U.S. annually.

GREGORY SNEIDER: Ok so you discontinue the antimalarial and give some artesunate?

DANA POTTER: No. Unfortunately, partial resistance has already developed to artemisinins in some regions of the world. The WHO recommends these **compounds** always be used in combination with other antimalarials to try to avoid the development of further resistance.

GREGORY SNEIDER: So what was Mrs Williams's treatment?

DANA POTTER: She received IV quinidine locally and then artesunate when it was acquired at the tertiary care facility. She appeared to quickly benefit from the artesunate and then recovered without severe neurologic sequelae.

GREGORY SNEIDER: Ok. Well I had no idea that drug existed. Thanks Dana.

DANA POTTER: You're welcome, this one was great to research!