Title: **Consultation in out of hours practice: Clinical review of Lyme disease**

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ABSTRACT

Telephone triage and virtual consultation has been expediated in the out of hours urgent primary care setting in recent times. This brings challenges in relation to gaining a comprehensive history and building a therapeutic relationship between nurse prescriber and patient. This article presents a clinical review of Lyme disease to explore consultation models and how implementing a hybrid consultation approach may support the practitioner to develop safe prescribing practices and optimise patient expectations.

Review of Lyme disease management highlights the sparse, low-quality evidence available with national guidance indicating antimicrobial treatment for those who present with an erythema migrans rash prior to laboratory testing confirmation. This reinforces the importance of reaching a shared decision with patient understanding of the perceived risk and benefits of treatment. Factors discussed include Lyme disease prevention and how the practitioner ensures safety netting in the out of hours setting.

Keywords

Lyme disease; Doxycycline; advancing practice; consultation models; nurse prescribing.

Key points

Consultation processes and models must evolve and adapt to meet contemporary healthcare provision of virtual and telephone health assessment.

The incidence of Lyme disease in the UK is predicted to be greater than 8000 annual cases leading to an increasing burden on patient morbidity, resources and society.

The research evidence on antibiotic prophylaxis and treatment of Lyme disease has been described as sparse, conflicting and of low quality.

NICE guidelines state the presence of an erythema migrans rash can be considered diagnostic of Lyme disease and antimicrobial treatment is indicated without confirmation from laboratory testing.

Reflective questions

1. A consultation model provides structure, but one size does not fit all. Consider whether a hybrid approach could be adapted to individual patients' needs in your specialist area of practice.
2. Utilising evidence-based guidelines are an essential factor in prescribing decisions but it is also imperative that the practitioner reviews the evidence behind these guidelines. How does this promote shared-decision making with the patient?
3. Ticks infected with Lyme borrelia are more prevalent in certain geographic areas and conditions. What health promotion advice would you give to someone who is concerned about exposure to tick bites and how to minimise their risk?

INTRODUCTION

Undertaking an accurate and comprehensive consultation history is considered one of the most important factors in ensuring a safe prescribing decision (Young et al. 2009). This can be particularly challenging when using telephone and video consultation methods where visual clues and the subtleties of language can be difficult to interpret (Car et al. 2004). Remote consultation has been a fixture in healthcare for some time but its use has been expediated in response to COVID 19 restriction (Churchouse et al, 2021). In the out of hours (OOH) urgent primary care setting the initial patient consultation is via a phone call and a follow up in-person consultation only occurs when deemed clinically necessary.

This article discusses the evolution of consultation models and the adaptation of these for use in the telephone triage system used in an OOH setting. This will focus on a clinical review involving a 60-year gentleman Dan, who contacted the OOH service with concerns about potential of contracting Lyme disease following a tick bite.

CONSULTATION MODELS

Consultation models were originally developed as a means to explore and understand the psychological aspects of doctor-patient consultations, in addition to providing a structure to the process (Denness, 2013). Predominantly these were based on a traditional medical approach of face-to-face consultation with a hierarchical balance veering towards the clinician who led both the consultation and decision making. Over time the consultation process evolved from physician centric to become more patient-centred with the emphasis placed on establishing a therapeutic relationship to explore individual health and well-being whilst also focusing on public health promotion (Willcox and Munson, 2007).

Consultation models which have gained popularity such as Neighbour's Inner Consultation model (1987) and Calgary-Cambridge model (Silverman, Draper and Kurtz, 2008) encourage patient-centredness with a holistic, shared partnership approach. Neighbour's

focusses on five checkpoints which summarise the patient's story to ensure an accurate interpretation, while using both open and closed questioning to clarify factual information and encouraging negotiation between the clinician and the patient. However, it has been suggested Neighbour's method of structured questioning leads to vital pieces of information being missed and that it does not provide a means to complete the consultation (Munson and Willcox 2007). Conversely, Young et al (2009) argue Neighbour's model does complete the consultation by considering the 'what ifs' and safety netting so that the patient understands what to do if the agreed treatment is not effective. The Calgary-Cambridge model, although similar in its stepwise holistic, patient-centred approach, aims to develop a rapport throughout and provides direction in completing the consultation, summarising and clarifying any agreed plan. Although this model identifies five core tasks, there are 70 sub-steps to consider which can time-consuming and add complexity to a consultation process.

Current opinion on the variety of models available has progressed to Denness (2013) suggesting there is no ideal consultation model, whereas Pawlikowska et al. (2012) recommends a flexible approach to each patient interaction. Willcox and Munson (2007), whilst also advocating flexibility, question if practitioners should employ a hybrid mix of different consultation models to meet individual patient needs and expectations. More recently, Nuttall and Rutt-Howard (2020) introduced the Consultation Umbrella, which incorporates aspects from Neighbour, Pendleton and Calgary-Cambridge models. This aims to promote an organised approach to therapeutic communication and clinical decision making, elements which are essential to the success of the patient encounter in contemporary healthcare.

OOH consultation process

In the urgent OHH setting members of the public initially contact NHS 24. Based on severity of the patient's clinical condition they are triaged to either a telephone consultation or immediate referral for an in person appointment. Dan's call regarding his tick bite was triaged for a telephone consultation with the advanced nurse practitioner. The

Royal College of Nursing (2018) identified advanced nurse practitioners as autonomous decision-makers, who can assess, diagnose and implement treatment appropriate to the healthcare needs of their patients, they are accountable for the decisions they make for patients which includes prescribing medicines. Prior to contacting Dan, preparation for the consultation involved reviewing the triage information and accessing any relevant evidence-based guidelines. During the initial process of information gathering it is essential to remain open minded to differential diagnosis as there is a risk of pre-conceived outcomes and assumptions being made prior to the encounter.

The telephone consultation with Dan began with initial introductions as an ice-breaker. Employing Neighbour's Inner Consultation model, Dan was encouraged to relay in his own words what had happened and express his concerns. Silverston (2013) identified most patients will tell you what the problem is within the first few minutes if left uninterrupted, however, it is important to also employ verbal encouragement to show interest. Utilising a structured approach based on a consultation model ensures that important information is not missed, an understanding of what is important to the patient is gained whilst also allowing a natural flow to the conversation. Chaudhry et al. (2020) identified potential adverse effects of telephone triage on patient safety due to difficulties in rapport building resulting in limited or irrelevant data gathering.

Dan had found a tick on his lower abdomen while showering that morning. He thought this may have occurred at least 5 days previously when last out hill walking. His wife removed the tick exposing a red circular rash on his abdomen. Over the past 2 days Dan had experienced mild flu-like symptoms and headache and he had self-medicated with paracetamol but remained symptomatic. Past medical history, current medications and allergies were verified to complete a full history consultation.

The presence of an erythema migrans rash at the site of a tick bite is considered indicative of exposure to *Lyme borreliosis* but the differential of tick bite hypersensitivity, or other

concerning symptoms must be excluded (National Institute for Health and Care Excellences (NICE) 2018). Given the potential diagnosis of Lyme disease an in-person consultation, and physical examination, was warranted.

The in-person consultation began with a recap of the information provided during the telephone assessment. Neighbour (1987) advocates 'summarising' as a way of showing understanding of the patient history and concerns, and it gave Dan the opportunity to amend or add further details. Using 'closed' questioning more in keeping with a traditional medical model allows a focus on potential 'red flags' in the history particularly for more serious symptoms which may indicate referral to secondary care **(Innes et al. 2018**). On clinical examination a red rash over the site of the tick bite with a 'bullseye' centre was evident. This was not itchy, hot or painful confirmed the lesion as erythema migrans whilst excluding the differential of a local reaction to the tick bite.

LYME DISEASE

Lyme Disease is a tick-borne disease caused by members of the *spirochaetal* complex *Borrelia burgdorferi* (Nuttall, 2018). It has become the most common tick-borne infection in many parts of Europe with predicted estimates of upward of 8000 annual cases in the UK with greatest prevalence in Scotland, South West of England and least cases in Northern Ireland (Cairns et al, 2019). The presence of erythema migrans, a 'bulls' eye' rash around the bite area from an infected tick, and flu-like symptoms represent an early manifestation of *Lyme borreliosis* although it can clinically present as a range of conditions including neurological, joint or cardiac abnormalities as well as chronic fatigue and myalgia (Tulloch et al. 2019). If left untreated, *Lyme borrelia* may progress to more serious and chronic manifestations.

Much of the evidence-based research for treating Lyme disease is sparse and of low quality. Internationally, clinical opinion differs regarding use of antibiotic prophylaxis for known tick

bites; the need for diagnostic confirmation of *Lyme borrelia* exposure and the antimicrobial choice, dose and length of treatment (Torbahn, 2016). The International Lyme and Associated Diseases Society (ILADS) acknowledge the variability of treatment options for prophylaxis treatment, effectiveness of erythema migrans treatment, and which antibiotic to prescribe as retreatment in persistent Lyme disease manifestations (Cameron et al., 2014). Given the sparsity of evidence the ILADS guideline strongly advocate a patient-centred approach to effectively engage patients in shared decision-making. Individuals make differing assessments of perceived risk to benefit based on risk tolerance and personal preference, which highlights the need to ensure the person is well informed and has a sufficient level of understanding of the full implications of their treatment choices.

NICE (2018) guidance highlights the lack of epidemiological data on Lyme disease in the UK but note that most tick bites do not transmit the disease. As the majority of UK native ticks are not infected with the bacteria, having been bitten by a tick does not presume the transmission of Lyme disease when there are no accompanying symptoms. Conversely, confirmation of a tick bite is not required in those who are symptomatic with an erythema migrans rash as this is considered sufficient evidence to initiate treatment and prescribe antimicrobial therapy. Guidance recommends diagnosing and offering antimicrobial treatment for Lyme disease without the need for laboratory testing in people who present with erythema migrans (NICE, 2018)

MEDICINES MANAGEMENT

The first-choice antibiotic treatment for Lyme disease in adults is determined by the symptom presentation (NICE, 2018). The antimicrobials recommended are Doxycycline, Amoxycillin or Cefuroxime. Alternative choice includes Azithromycin in patients with no Lyme Disease associated cardiac abnormalities. Dan was already aware of the potential of Lyme disease, highlighting this amongst his concerns and reason for contacting health services, and was

keen to start treatment. Given the clinical presentation a shared decision was reached to commence antimicrobial treatment with the prescription of Doxycycline. (Table 1).

Treatment plan	Doxycycline 100mgs capsules. Take 2 capsules once daily for 21 days. Complete full course.
Administration	Take on an empty stomach at least 1 hour before or 2 hours after eating. Take with water to minimise potential of gastric irritation. Avoid oral antacids and indigestion remedies, or medicines containing zinc or iron as this can decrease absorption.
Safety netting	Referral to GP/call NHS24 if • side effects of medication • worsening signs of Lyme disease • no improvement in current symptoms after completion of 21-day course.

Table 1: Medicinal management

The consultation was completed with safety netting advice and ensuring Dan understood how to take his medication. Doxycycline is a second-generation Tetracycline antimicrobial used as a broad-spectrum treatment in a variety of conditions, and although unlicensed for this use, it includes *Lyme borreliosis* (BNF, 2022). It was important to discuss with Dan the use of an unlicenced medication in addition to the implications of the treatment choices to facilitate concordance (Barratt 2018). Dan was made aware of common side-effects and it was highlighted that Doxycycline can cause increased photosensitivity to sunlight and to protect his skin particularly if he was to resume hill walking during the 21-day course. As with all antimicrobial treatment consideration was given to minimising the spread of antimicrobial resistance through patient awareness (Dexter and Mortimore, 2020). The importance of completing the full course of Doxycycline was stressed, and although the lesion should improve in approximately 2 weeks Dan should not stop taking the medication. The caveat to this was that the lesion may take longer than 2 weeks and follow up would be required with his own GP. Health education was discussed in relation to potential signs of

worsening Lyme disease which would warrant further investigation or treatment. Dan was also supplied with health promotional information on Lyme disease and how to safely remove a tick in future. (NHSinform 2022) (Table 2)

Be tick aware	• Ticks are most active between spring and autumn and prefer moist areas like woodland, moorland and urban parks and gardens. • Avoid brushing against vegetation and use insect repellents. • Carry out a tick check of skin folds, armpits, groin, waistband area, back of the neck and hairline.
What to do if you are bitten by a tick	• Remove ticks as soon as possible using fine-tipped tweezers or a tick removal tool. Grasp the tick close to the skin and pull steadily upwards without twisting or crushing the tick. • Be careful not the leave mouthparts in the skin. • Do not burn off tick or squeeze the body as you remove it. • Clean the bite area, apply antiseptic cream and monitor for several weeks for any changes. • If you develop flu-like symptoms or a spreading circular red rash contact GP/NHS 24.

Table 2: Be tick award health promotion

CONCLUSION

Consultation models provide an essential structure to the assessment of health and well-being to support the development of safe and effective prescribing practice. It enables a sharing of information but also of understanding between the practitioner and patient to reach a mutually agreed management plan. Like health care provision these have evolved to meet the requirements of contemporary practice. This case study demonstrates the adaptability of out of hours practice with a hybrid consultation process to ensure the appropriate diagnosis and management of Lyme disease given the constraint of virtual assessment. It also underscores the necessity of safety netting when practicing within the confines of an isolated patient encounter when dealing with a disease which can progress to a chronic condition, with resulting impact on patient and societal outcomes.

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