Letter

Sherlock Holmes and the dermatologist

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To the Editor

Envisioned in 1887 by physician Sir Arthur Conan Doyle, the detective Sherlock Holmes enamored numerous readers with his wit and investigative skill.[1] Dr. Doyle based Holmes on his mentor Dr. Joseph Bell, who emphasized the importance of close observation in making diagnoses.[1] Imagined by one physician and modeled after another, what teaching points can the famous detective offer dermatologists?

Perhaps the most relevant lesson is from *The Adventure of the Lion's Mane*, a story involving a dermatologic diagnosis.[1] Although Holmes was walking along the seashore with a friend, the pair encounter the local science teacher who soon collapses and dies.[1] Guided by his career of pursuing criminals, Holmes makes a rare error and assumes the long, narrow welts on the teacher's body arose from foul play, fruitlessly hunting for a human culprit.[1] However, after another swimmer presented with similar painful welts, Holmes ascertained the true culprit: *Cyanea capillata,* or the Lion's Mane jellyfish, whose venom proved lethal to the teacher's weak heart.[1]

Although Holmes is a master of inductive reasoning, his thinking here was biased by heuristics and deductive reasoning. By seeking human culprits based on past experiences, Holmes relied on heuristics, or mental shortcuts that enable quick decision-making.[2] Heuristics are pragmatic problem-solving methods that employ simple, efficient "rules of thumb" based on readily accessible information to make decisions, such as diagnosing a patient based on past clinical experiences or prevalence of a disease in a particular population.[2] Although heuristics can efficiently address routine problems, it is less effective in complex scenarios owing to biases, oversimplifications, and reliance on insufficient data.[2] Similarly, deductive reasoning relies on an accepted premise such as "the welts arose from foul play" to draw conclusions, potentially leading one astray based on erroneous assumptions.[2]

This cautionary tale is pertinent to dermatologists, whose fast-paced and repetitive clinical practice may lead to an over-reliance on the availability heuristic leading to misattributing a general symptom to a specific, frequently encountered disease.[2] Heuristics may systematically fail for complex or rare pathologies causing misdiagnosis, treatment delays, and avoidable complications.[2] For example, a 56-year-old man with Fitzpatrick phototype VI skin had a solitary chest nodule that was diagnosed as a keloid but never biopsied.[3] One year later, he presented to the emergency department for night sweats, abdominal pain, dyspnea, and weight loss. He was hospitalized and treated for splenomegaly and thrombocytopenia and was seen by a dermatology consultant after discharge, whereupon biopsy of the nodule revealed marginal zone lymphoma.[3] In this case, the availability heuristic of commonly associating keloids with skin of color led to potentially life-threatening misdiagnosis and treatment delay. Furthermore, it exemplified how heuristics and cognitive biases can perpetuate health care disparities for skin of color patients.[3]

Dermatologists use inductive reasoning for clinical diagnosis of skin disease. Unlike the top-down approach of deductive reasoning, which draws specific conclusions from general premises, inductive reasoning is a ground-up approach relying on data and observations to form conclusions.[2] For example, dermatologists use inductive reasoning to identify the etiology of rashes using morphologic reaction patterns.[4] After identifying a primary lesion, dermatologists characterize its morphologic reaction pattern as papulosquamous, eczematous, vascular, dermal, or vesiculobullous to formulate a differential diagnosis.[4] Dermatologists also employ inductive reasoning for neoplasms using dermoscopy, observing structures to differentiate benign versus malignant lesions and identify potential melanomas through a two-step algorithm.[5] Structures indicative of melanoma include atypical networks, focal streaks, and shiny white lines, warranting further evaluation and/or biopsy.[5] Just as Holmes used a magnifying glass to search for clues, dermoscopy enables dermatologists to utilize "detective skills" to draw conclusions from clinical findings.

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One of Holmes's favorite sayings is "Data! Data! Data! I cannot make bricks without clay."[1] His adage reminds dermatologists to practice inductive reasoning by thoroughly employing investigative methodologies when generating differential diagnoses.

Potential conflicts of interest

The authors declare no conflicts of interest.

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