Review Article

Evaluation of red flags minimizes missing serious diseases in primary care

R. P. J. C. Ramanayake[1], B. M. T. K. Basnayake[1]

[1]*Department of Family Medicine, Faculty of Medicine, University of Kelaniya, Colombo, Sri Lanka*

Abstract

Primary care physicians encounter a broad range of problems and therefore require a broad knowledge to manage patients. They encounter patients at early undifferentiated stage of a disease and most of the presentations are due to non sinister problems but in minority of patients same presentations could be due to serious conditions. One of the main tasks of a primary care doctor is to marginalize the risk of missing these serious illnesses. To achieve this they can look for red flags which are clinical indicators of possible serious underlying condition. Red flags are signs and symptoms found in the patient's history and clinical examination. Evaluation of red flags is of paramount important as decision making is mainly dependent on history and examination with the availability of minimal investigatory facilities at primary care level. Some Red flags like loss of weight and loss of appetite are general in nature and could be due to many pathologies while hematemesis and melena are specific red flags which indicate GIT bleeding. All red flags, whether highly diagnostic or not, general or specific, warn us the possibility of life-threatening disorders. The term 'red flag' was originally associated with back pain and now lists of red flags are available for other common presentations such as headache, red eye and dyspepsia as well. Identification of red flags warrant investigations and or referral and is an integral part of primary care and of immense value to primary care doctors.

Keywords: General practice, primary care, red flags, serious diseases

Introduction

General practice/primary care is the first medical contact within the health-care system, providing open and unlimited access, dealing with all health problems regardless of the age, sex, or any other characteristic of the person concerned.[1] Therefore, primary care physicians require a broad knowledge of medicine and the role of the general practitioner (GP) in patient management is problem recognition and decision-making rather than arriving at a definitive conclusion.

In primary care, patients often present with nonspecific symptoms and the incidence of serious illness is low. Differentiating between innocent symptoms and a rare, but serious organic disease is a challenge for the primary care physician. Unnecessary referrals and diagnostic testing need to be balanced against the risk of missing a diagnosis.[2] The red flag concept is of immense value in facing this challenge.

The one main aim of the GP in the process of management is to marginalize danger by recognizing and responding to signs and symptoms of possible serious illness. In primary care, they have limited access to perform investigations to catch up serious medical conditions,[3] but for each presentation, primary care physician can look for red flags which are clinical indicators of possible serious underlying condition requiring further medical intervention.[4] The presence of red flags indicates the need for investigations and or referral. Essentially red flags are signs and symptoms found in the patient history and clinical examination that may tie a disorder to a serious pathology.[5] Hence, the evaluation of red flags is an integral part of primary care and can never be underestimated.

Address for correspondence: Dr. R. P. J. C. Ramanayake, Faculty of Medicine, University of Kelaniya, Colombo, Sri Lanka.
E-mail: rpjcr@yahoo.com

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The term "red flag" was originally associated with back pain. They were actually designed for use in acute low back pain, but the underlying concept can be applied more broadly in any presentation. The first catalog of red flags for back pain appeared in the literature in the early 1980s, and since then numerous lists have been compiled.[6]

Recognizing and managing "red flags" in clinical medicine also presents a challenge[6] since all the red flags do not have an equal diagnostic power. Some are highly diagnostic while others are far less diagnostic. Even the presence of far less diagnostic red flags does not exclude the possibility of serious pathology so one must assume its presence until proven otherwise.[7]

Some red flags are general in nature because they have several possible explanations. General red flags direct the clinicians to recognize a serious illness even though the exact disease is not known. Unexplained weight loss is one such general red flag.

Specific red flags signal-specific illnesses and present in specific anatomical regions. When a chronic nonsteroidal anti-inflammatory drug user presents with coffee ground vomiting, it is a specific red flag for upper gastrointestinal bleeding due to peptic ulceration.

Even common and mild signs and symptoms can indicate a serious illness when combined with other specific signs and symptoms. Constipation is not a red flag by itself, but when it is combined with painless per rectal bleeding, the combination is a red flag for possible colonic cancer.

But all red flags, whether highly diagnostic or not, general or specific, warn us the possibility of disabling and life-threatening disorders. Hence, it is important to remember that they only need to be sufficiently suggestive to compel us to rule out a serious condition to be a red flag.[7]

There is confusion however as different guidelines have produced a different set of red flags for the same presentation. Koes *et al.* in their review of 8 back pain guidelines,[8] revealed that none of the eight guidelines they reviewed, endorsed the same set of red flags. In addition, guidelines generally provide no information on the diagnostic accuracy of a particular red flag, which limits their value in clinical decision-making. However, evaluation of red flags is a useful way of identifying patients with a higher likelihood of sinister pathology. It is essential to use the clinical acumen to overcome the deficiencies.

Backache

Most adults experience low back pain at some point during their lives, making it one of the most common conditions encountered in primary care.[9,10] Most low back pain in primary care is mechanical in nature and does not signify a dangerous underlying abnormality, but minority indicates a serious condition, such as inflammatory disease, fracture, or cancer.[11] Among low back pain patients in primary care between 1% and 4% will have a spinal fracture[12] and in <1% malignancy, primary tumor, or metastasis.[13]

Identification of serious pathologies, when they exist, is important in the clinical assessment and further assessment and specific treatment is usually required.[11,14] For instance, early detection of spinal malignancy could prevent further spread of metastatic disease.[15] Identification of spinal fracture will prevent the prescription of treatment such as manual therapy, which is contraindicated,[16] as well as directing the patient toward further testing and treatment of underlying disease (such as osteoporosis). Despite the potential consequences of a late or missed diagnosis of these serious pathologies, their low prevalence in primary care settings does not justify routine, ancillary testing of patients presenting with low back pain. Therefore, it is a challenge for the primary care doctor to detect and not to miss patients with serious underlying pathologies. Evaluation of red flags is of immense value in such instances to a busy primary care physician [Table 1].[17,18]

Headache

Headache is among the most common pain problems encountered in family practice. One epidemiologic study found that 95% of young women and 91% of young men experienced a headache during a 12-month period; 18% of these women and 15% of these men consulted a physician because of their headache.[19]

Table 1: Red flags for low back pain[17,18]

Red flag	Possible condition
Age <20 or over 50 years Previous history of cancer Unexplained weight loss Night pain not relieved by rest Failure to improve with therapy Pain persists for >4-6 weeks	Cancer
Fever with chills. Persistent fever (temperature >100.4 F) History of intravenous drug abuse Severe pain Lumbar spine surgery within the last year Recent bacterial infection Immunocompromised states	Infection
Saddle anesthesia Bladder/bowel dysfunction.(anal sphincter tone decreased or fecal incontinence, urinary incontinence or retention) Motor weakness/sensory deficit	Cauda equina syndrome
Prolonged use of corticosteroids Age >70 years History of osteoporosis Mild trauma over the age of 50 years (or with osteoporosis) Recent significant trauma at any age	Vertebral fracture
Significant morning stiffness Improvement with exercise Limitation in all spinal movements Alternating buttock pain Younger age	Ankylosing spondylitis or other inflammatory disorder

Table 2: Red flags for headache[18,21]

Red flag	Possible conditions
Headache onset after 50 years	Temporal arteritis Mass lesion
Sudden onset "thunderclap" headache	Subarachnoid hemorrhage Hemorrhage into a mass lesion Mass lesion (especially posterior fossa mass) Hypertensive emergency
Progressive in frequency or severity	Medication overuse headache CNS mass lesion Subdural hematoma
Headache with signs of systemic illness (fever, neck stiffness, photophobia, chronic malaise)	Meningitis/encephalitis
Focal neurological signs (progressive visual disturbance, weakness, clumsiness, or loss of balance)	Mass lesion Vascular malformation Stroke
Papilledema (increased intracranial pressure)	Encephalitis CNS mass lesion Meningitis
Headache subsequent to head trauma	Intracranial hemorrhage Epidural, subdural hematoma Posttraumatic headache
Focal tenderness over temporal artery	Temporal arteritis
Pregnancy or immediately postpartum	Venous sinus thrombosis Carotid artery dissection Pregnancy-induced hypertension (preeclampsia)

CNS: Central nervous system

Table 3: Red flags for gastroesophageal reflux disease symptoms[22]

Red flag	Possible conditions
Aged 40-45 years or older at first presentation Family history of gastric cancer with onset age <50 years Severe or persistent dyspepsia Chronic gastrointestinal bleeding Unexplained weight loss Difficulty in swallowing Persistent or protracted vomiting Iron deficiency anemia Palpable abdominal mass Coughing spells or nocturnal aspiration	Carcinoma of esophagus stomach
Previous peptic ulcer disease Long-term ingestion of NSAIDs including aspirin. Chronic gastrointestinal bleeding Severe or persistent dyspepsia	Perforated peptic ulcers

NSAIDs: Nonsteroidal anti-inflammatory drugs

It is diagnostically and therapeutically useful to consider headaches being divided into two categories as primary and secondary. Primary headaches, which include migraine, tension-type headache, and cluster headache, are benign. These headaches are usually recurrent and have no organic disease as their cause. Secondary headaches are caused by underlying organic diseases ranging from sinusitis to subarachnoid hemorrhage.[20] The primary task of the family physician is to determine whether a patient has an organic, potentially life-threatening cause of headache [Table 2].[18,21]

Table 4: Red flags for red eye[23,24]

Red flag	Possible condition
Moderate to severe pain	Acute angle closure glaucoma Endophthalmitis Corneal ulcer
Decreased vision	Acute angle closure glaucoma
Chemical injury	Corneal ulceration
Penetrating injury	Foreign body
Pupil irregularity	Iritis
Sluggish pupillary reaction to light	Acute angle closure glaucoma
Corneal opacification	Corneal ulceration
Circumcorneal redness	Acute angle closure glaucoma Iritis Corneal ulcer

Red flags of Symptoms Suggestive of Gastroesophageal Reflux Disease

Gastroesophageal reflux disease can manifest in a multitude of symptoms, the most common being heartburn and regurgitation. Even though its benign most of the time these symptoms also could be due to a sinister pathology. Screening for red flags helps to identify sinister pathologies [Table 3].[22]

Red Eye

The most likely cause of a red eye in patients who present to general practice is conjunctivitis. However, red eye can also be a feature of a more serious eye condition, in which a delay in treatment due to a missed diagnosis can result in permanent visual loss.

Most general practice clinics will not have access to specialized equipment for eye examination, for example, a slit lamp and tonometer for measuring intraocular pressure, and some conditions can only be diagnosed using these tools. Therefore, primary care management relies on noting key features to identify which patients require referral for ophthalmological assessment [Table 4].[23,24] In general, a patient with a unilateral presentation of a red-eye suggests a more serious cause than a bilateral presentation.[23]

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Conflicts of interest

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