Do we need 'routine' blood counts?

Performing daily blood counts has become a routine part of hospital practice but with limited thought given to the need for them. In addition, the occasional abnormalities in these tests trigger further investigations which may have not been necessary if clinical examination was given adequate importance.

Every hospital performs a full blood count on most of their patients daily and, in some cases, more than once a day. Although these blood tests have become a routine part of day-to-day management, they undoubtedly put an enormous pressure on laboratory staff and other health-care professionals (phlebotomy services and junior doctors). Are routine blood counts really necessary, or should blood counts should only be done if a new, clinically significant abnormality is likely to be detected? In this context, physicians from the United States as part of the initiative of the American Board of Internal Medicine Foundation have designed recommendations under the umbrella 'Choosing Wisely' (www.choosingwisely.org). These are intended to help physicians and patients reduce overuse of tests and procedures and support efforts to make smart and effective care choices. The pragmatic approach of Choosing Wisely campaign is that five key questions are asked before performing a test or the procedure. Although routine blood count is not part of this campaign, the same approach can be applied to reduce these requests.

Does the patient really need this test?

First of all, what needs to be remembered is that no test is routine. Are we able to answer a clinical question by a blood count? Has the patient got symptoms of anaemia? If we find low haemoglobin in the absence of symptoms, should the patient be transfused? If not, will the lower haemoglobin be meaningful? Guidelines suggest that red cell transfusions are not of benefit until the haemoglobin is less than 60–70 g/litre (Carson et al, 2012). How often does a routine blood count pick up such low haemoglobin?

A white cell count is of assistance if there are any signs of infection. In the absence of clinical evidence of an infection, will the raised white cell count by itself determine the use of antimicrobials (especially in the current epidemic of antibiotic resistance)? On the contrary, the higher white cell count will trigger many other tests in the attempt to identify infection despite any clinical clues. Low platelet counts usually cause bleeding but the platelet counts have to be extremely low (less than 20–30 x 10^9/litre) for this to occur. In the absence of bleeding, treatment is not usually indicated to raise platelet count as recommended by the international consensus document on the management of primary immune thrombocytopenia (Provan et al, 2010). A lower platelet count in the absence of bleeding is only useful if a surgical or interventional procedure is planned, not on a routine basis.

What are the risks?

Although performing blood counts may be considered a straightforward procedure, there is evidence that repeated phlebotomy can contribute to anaemia. In a retrospective cohort study in hospitalized general medical patients, phlebotomy was highly associated with changes in haemoglobin levels and contributed to anaemia (Thavendiranathan et al, 2005). Volume of phlebotomy remained a strong predictor of drop in haemoglobin after adjusting for other predictors. On average, every 100 ml of phlebotomy was associated with a decrease in haemoglobin of 0.7 g/dl. Salisbury et al (2011) studied nearly 18 000 patients with acute myocardial infarction from 57 American hospitals. Moderate to severe hospital-acquired anaemia developed in 20% of patients, with phlebotomy volume higher in patients who developed anaemia than those who did not (139.3 ml *vs* 52.0 ml; $P<0.001$).

Latest published literature and newer medical textbooks note abnormalities in full blood count as being identified as part of a routine screen. Most GPs would perform a routine blood count in most patients despite no reason to suspect a high or low result. However, as a result of identifying the blood count abnormality and instigating a haematology referral, occasionally the original symptom may be overlooked and not followed up. All the abnormal blood counts certainly trigger many further investigations which may not have been necessary but certainly add to the anxiety of the patient and the carer.

Are there simpler, safer options?

A good clinical history and physical examination should be the simplest, safest option before blood testing. Blood tests including full blood counts should only be performed to confirm the suspected findings. However, the current practice seems to be the reverse; that history and clinical examination follows laboratory abnormalities. Herbret Fred (2005) called this situation 'hyposkillia', the deficiency of clinical skills, which is defined as:

'the situation of physicians who cannot take an adequate medical history, or perform a reliable physical examination, but become proficient at ordering all kinds of tests and procedures without knowing when to order or how to interpret them.'

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This laboratory-oriented approach diminishes the direct contact with patients, and the therapeutic value of the human touch compared with a patient-oriented mind-set (Ramani et al, 2010). Needless to say, the former approach takes away the excitement and satisfaction of making a diagnosis using knowledge and skills.

What happens if I don't do anything?

In an individual where reasons to suspect an abnormal result do not exist, it is unlikely that an 'earlier' pick-up of an abnormality may help with early management of a condition. For example, a patient with mild to moderate neutropenia or thrombocytopenia is unlikely to have any serious clinical consequences in the absence of an infection or need for procedures respectively. In addition, studies have shown that strategies to reduce blood tests have not seen any adverse changes in clinical outcomes but did have financial savings. The implementation of a resource utilization committee in one institution is a good example (Neilson et al, 2004). This committee analysed the ordering habits of providers during previous years and modified the computer software with a daily prompt that asked providers whether they wanted to discontinue tests scheduled beyond 72 hours. This reduced several common laboratory tests including a 15% reduction in blood counts. Despite this significant reduction, clinically important variables like length of stay, readmission or mortality did not change.

In the current health-care setting, many routine tests are requested or performed by junior doctors. This is likely in the best intention and following what has been taught in the medical school and by textbooks. This habit also arises from the fact it is easier to do the test than not do it. In this situation, it should be the responsibility of more senior team members to provide explicit guidance on when a test should be requested and the reasons for the same. The fear of 'what the consultant might think if I have not done the blood tests' should not be a reason.

On a different note, what about the situation in the current litigation-predominant world? In simple terms, if a test had not been done, there cannot be any medicolegal implications. However, a not uncommon scenario in practice is that many of the blood results are not looked at and not acted upon which does have serious implications. This once again stems from the laboratory-oriented approach that the tests are done with little need to confirm the clinical suspicions. One survey of 262 physicians reported that despite spending on average 74 minutes per day managing test results, only 41% of physicians were satisfied with how they managed test results (Poon et al, 2004). Interestingly, physicians who actively tracked their test orders to completion were more likely to be satisfied. In other words, the person ordering the test should check the results and act on the abnormal ones to reduce litigation.

How much does it cost?

A full blood count in the author's laboratory costs around £5 per test (about £6000 per day for an average 1200 tests) but the hidden costs of time and work involving allied health professionals like doctors, nurses, phlebotomists and further investigations based on an abnormal result are not considered in this 'small amount'. Stuebing and Miner (2011) analysed the financial impact of 'surgical vampires' in a tertiary care hospital setting. The charges for daily phlebotomy were $147.73 per patient per day. In a re-analysis after 11 weeks of residents being made aware of the daily charges for phlebotomy, the charges dropped considerably to as low as $108.11, a total saving of nearly $55 000. This would mean that informing health-care providers of the cost of phlebotomy (and the tests) can decrease the amount of these tests ordered and result in significant savings for the hospital.

Any efforts already been made?

The value of any test is dependent on the pre-testing variables which if understood would help the blood test request process. Bandolier (2001) from Oxford University cited the practice of GPs who ordered blood tests on one of every 25 patients attending the surgery. They highlighted three potential problems – high costs, a large amount of information and the statistical problem (since normal ranges only pertain to 95% of results in a normal population, 5% will be 'abnormal' even when there is no disease). The randomized controlled trial by van Wijk et al (2001) is very interesting in this context. They compared the effect of two versions of a computer-based clinical decision support system on blood test ordering among GPs in 44 practices in the Netherlands. GPs who used the support system requested 20% fewer tests on average than GPs who did not (5.5 +/- 0.9 tests *vs* 6.9 +/- 1.6 tests respectively; P= 0.003). This could translate to a large number of tests in areas covering a big population.

Conclusions

The habit of 'routine' blood test ordering should stop. Any blood test request should follow a thorough history and good clinical examination and a clear reason be given for the request; the likely information the test should generate. This practice will have significant cost savings but probably more importantly, provides doctors with the huge satisfaction that clinical skills are still the best diagnostic strategy in the technology-driven world. BJHM

KEY POINTS

- Blood test requests including full blood counts should follow a thorough history and systematic clinical examination.
- There should be a clear indication for full blood counts, in other words they should not be performed as routine.
- It is also necessary that these tests when performed are followed up appropriately to reduce further investigations and medicolegal costs.

Conflict of interest: none.

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