

HemoCue Hb • ANEMIA AND AGING



New light on anemia
in aging

 **HEMOCUE**[®]

Poor balance, poor memory and fatigue – inevitable consequences of aging? Or maybe anemia?

More than ten percent of non-institutionalized people over 65 in the US suffer from anemia and the prevalence increases with age. Over the age of 85 as many as every fourth man and every fifth woman are anemic. Anemia can be a side effect of a number of chronic diseases and is known to increase mortality in patients with chronic kidney disease, congestive heart-failure and acute myocardial infarction – independent of underlying disease. Recently it was

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also found that anemia itself is a risk factor for development of dementia. Since the world's elderly population is increasing, anemia is expected to become a significant healthcare burden and most certainly will affect the quality of life for a large group of people. However, anemia is not an inevitable consequence of aging, therefore, in most cases it can be successfully treated.

There are a few things that make anemia difficult to detect, especially in the elderly. The symptoms of anemia can sometimes be mistaken as part of the normal aging process. In addition, anemia usually develops gradually. A person suffering from anemia initially adapts to the lower hemoglobin (Hb) value without noticing. Testing for anemia on a regular basis is a solution to the problem; simply make it a part of every general physical examination.

Herman Nilsson-Ehle, MD and PhD, is an associate professor at the Section of Hematology and Coagulation at the Sahlgrenska University Hospital in Göteborg, Sweden. He has 30 years of experience treating patients suffering from anemia.



**Never accept a low Hb.
Find the reason.**

"Sometimes there is a somewhat negligent attitude towards low Hb values in elderly people. There is a tendency to think that old age is inevitably accompanied with a low Hb and that it is nothing to pay any further attention to. But that is not true", says Dr Herman Nilsson-Ehle, hematologist at the Sahlgrenska University Hospital in Göteborg, Sweden.

In a large prospective, longitudinal study with more than 1 000 people born in the beginning of the 20th century (the H70-study) the focus has been to examine the health and quality of life of elderly people. The participants were examined eight times over 18 years, beginning at age 70. Since the same persons were followed through the years, they became their own controls. This is an advantage when it comes to finding out what a normal Hb value is for that person, and what is not.

Causes of Anemia:

- ☑ Blood loss
- ☑ Deficiencies (iron, B12/folic acid)
- ☑ Chronic diseases (eg cancer, rheumatoid arthritis, inflammation)
- ☑ Unexplained

Consequences of Anemia:

- ☑ Low muscle strength
- ☑ Poor balance
- ☑ Loss of concentration
- ☑ Headache
- ☑ Depression
- ☑ Fatigue
- ☑ Shortness of breath

Anemia, a common feature of:

- ☑ Cardiovascular conditions
- ☑ Kidney disease
- ☑ Diabetes

Herman Nilsson-Ehle and colleagues have found that the Hb values of elderly people do not decrease dramatically as a consequence of age. In healthy men, Hb declines by 0.9 -1.0 g/dL (7%) between the ages of 70 and 88 years. In healthy women however, the Hb value stays at the same level throughout life. Each individual has their own biologically normal Hb. Therefore, it is important to compare a patient's Hb value to earlier values to determine if a change has occurred.

The important thing, according to Herman Nilsson-Ehle, is to further investigate dramatic decreases in a patient's Hb value since there is always a reason. One common cause for a drop in Hb is inflammation, such as rheumatoid arthritis, a general infection or an inflammation of the bone marrow. Bleeding from sources such as intestinal ulcers, adenoids or cancerous tumors may also cause anemia. Other causes are deficiencies of vitamin B12, folic acid or iron, or a shortened life-cycle of blood cells which can be caused by some medications or by auto-immune processes.

"In our studies we found a cause for the anemia in nearly all, if not all cases. Once the type of anemia is known, it is possible to give the correct treatment. Low Hb values should be treated, even if the patient may be too sick or frail to undergo investigation regarding the underlying cause. Even if it may seem difficult to find the reason for the low Hb of say a woman of 80+ it is important to do so. If she falls because of dizziness that is when it gets really difficult. Since a low Hb is an indicator that something is wrong, and since a Hb-test is both very simple to perform and is done at low cost, it should definitely be done", says Herman Nilsson-Ehle.

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Dementia goes hand in hand with anemia.

An elderly person with good cognitive function but with anemia, has twice the risk as a non-anemic person developing dementia within three years. Since Hb is easy to measure and anemia can be treated, anemia is thus a modifiable risk factor for dementia.

This was found in a recent longitudinal study on people aged 75 and above. It was also seen that there is a dose-response relationship between Hb levels and risk of dementia. Or in other words, the lower the Hb concentration the higher the risk for developing dementia. The researchers suggest that a chronic hypo-oxygenation of the brain due to a decreased oxygen carrying capacity of the blood could be the biological mechanism behind their findings.

It was only in persons with an initially good cognitive function that anemia increased the risk of dementia. No such association was found in persons with lower cognitive function at the start of the study. This suggests that anemia only plays a role in the initial stages of the disease. It also supports the idea that anemia is a cause of dementia and not an effect of it.

The relationship between anemia and dementia seems to be independent of other chronic conditions potentially related to anemia and dementia since this was adjusted for in the study.

Atti, A.R. et al. Anaemia increases the risk of dementia in cognitively intact elderly. Neurobiol of Aging, 2006, 27; 278-284

Anemia: A risk factor for independence.

Elderly people with anemia have a higher risk of disability than non-anemic persons. They also have lower muscle strength and poorer physical function. Factors that, taken together, may threaten their independence.

Physical performance was measured in 1156 elderly persons living in Italy by testing standing balance, walking speed and ability to rise from a chair. Muscle strength in the hands and knees was also measured. To assess disability, the participants were asked if they needed help with six basic daily activities such as eating, bathing and dressing, and eight other activities such as shopping and doing light housework.

The results showed that anemic persons have significantly lower muscle strength than non-anemic persons. On the physical performance test they scored on average one point lower on a twelve-point scale. Earlier research has shown that one point on this test is quite large and is associated with increased risk of disability, hospitalization and mortality. Anemic persons also reported nearly twice as many disabilities compared to non-anemic persons.

The results were not simply consequences of disease, age or body mass index since the researchers adjusted for these and a number of other factors.

Penninx, B. W. J. H. et al. Anemia is associated with disability and decreased physical performance and muscle strength in the elderly. J Am Geriatr Soc 2004,52;719-724

Our solution is accurate point-of-care testing

Point-of-care testing the HemoCue way produces accurate lab quality results in seconds. An immediate answer enables immediate feed-back to the patient and no need for return visits just to discuss the test result. Point-of-care testing also decreases the paper work associated with sending blood samples for laboratory testing. All that is needed is 10 µL of venous or capillary blood. Our analyzers are portable, precalibrated and require a minimum of maintenance, and they are so simple to use they can be handled by non-laboratory personnel.

Reliable primary diagnosis of anemia.

Hb measurements performed at the point-of-care with the HemoCue analyzer are just as reliable as those performed with a reference cell counter. Therefore it is a waste of both time and money to send all blood samples to reference laboratories merely to detect anemia.

A large proportion of blood samples sent for study of anemia were found to have Hb levels within the normal range. Therefore a study was performed to see if point-of-care Hb determination is a good alternative. Blood samples, both capillary

and venous, were drawn from 247 patients in primary care for routine laboratory tests. The capillary blood was analyzed with the HemoCue analyzer, whereas the venous blood was analyzed with both the HemoCue Hb analyzer and the Pentra 120 Retic cell counter (reference). There were no statistically significant differences in Hb values obtained for these three sets of data. The authors conclude that measuring venous or capillary Hb with the HemoCue Hb analyzer is a valuable test for primary diagnosis of anemia in general practice.

Munoz, M. et al. Utility of point-of-care haemoglobin measurement in the HemoCue-B haemoglobin for the initial diagnosis of anaemia. Clin Lab Haem, 2005, 27; 99-104

