



Diagnosis of Multiple Myeloma through a Scoring System

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Abstract

The present study aims to present a scoring system to assess the probability of a diagnosis of multiple myeloma. Through the survey in the literature of the frequencies of the signs and symptoms of this disease, a system of scores was built that allows the physician to make comparisons between possible differential diagnoses, as well as always keeping in mind the possibility of multiple myeloma.

Introduction

Multiple myeloma has been considered as one of the most difficult neoplasms to make the diagnosis. This difficulty is basically related to the frequency of this disease in the population, of 9 cases for every 100,000 people/year, and to the non-specific nature of its clinical manifestations [1]. A late diagnosis can lead to more complications related to the disease and a worse prognosis.

The purpose of this article is to present a diagnostic instrument that uses a scoring system based on the frequency of signs and symptoms of the disease.

Material and Methods

Through research in the literature on multiple myeloma, a survey was made of the percentage frequencies of the signs and symptoms of multiple myeloma. These frequencies have been added up and transformed into scores, which together add up to a total of 100 points.

Results and Discussion

The clinical and laboratory changes of multiple myeloma found in the literature were as follows, in decreasing order: 88% of cases with proteinuria above 50 mg/day [2], 84% with erythrocyte sedimentation rate above 20 mm/h [3], 80% with bone lesions [4,5], 73% with normochromic normocytic anemia [2-4], 70% with vertebral fractures [6], 58% with bone pain [3,4], 32% with fatigue [3], 24% with weight loss [3], 21% with renal failure [3,7,8] and another 21% with hypercalcemia [9], 7% with changes in the number of platelets [3], 5% with paresthesias [3] and 1% with fever [3].

Light chain proteinuria, characteristic of multiple myeloma, was described in the 19th century by Bence Jones and is currently performed by immunoelectrophoresis [2]. Anemia (with hemoglobin ≤ 12 g/dl) is due to an inadequate production of red blood cells due to renal failure or due to the infiltration of the bone marrow by multiple myeloma cells [3]. Fatigue is usually related to anemia, and its duration can be as long as 12 months [3]. Renal failure, usually acute, is due to nephropathy caused by tubular deposition of light chain monoclonal immunoglobulins [3,7] and hypercalcemia [3], being evidenced by serum creatinine levels above 173 $\mu\text{mol/l}$ (or 2 mg/dl) [3,7,8]. Hypercalcemia defined by a corrected serum level of 11 mg/dl or greater, is rarely the only manifestation in symptomatic disease [9]. Thrombocytopenia ($<100 \times 10^9/l$) or thrombocytosis ($\geq 500 \times 10^9/l$) can occur in 5% and 2% of cases, respectively [3]. Fever due to multiple myeloma activity is not a common manifestation [3], having received a score of +1 per approximation for more.

Each percentage of a sign or symptom was divided by 564, which corresponds to 100% of their sum. So, in fact, each score is a corresponding percentage, whose new base is now 100.

And so, the present scoring system was built. The stage at which a disease is found is the main factor that can influence the frequency of each sign and symptom, as they usually appear throughout the natural history of the disease. The frequencies of the signs and symptoms presented in this study correspond to those when the diagnosis of multiple myeloma was made [6-9] (Table 1).

Diagnosing a disease is a process. Initially, the physician must consider some possible diseases that share the same signs and symptoms that are currently present. Skipping this step is an error, as an initially neglected diagnosis can lead to late treatment and a worse prognosis [1]. After this stage,

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Table 1: When the diagnosis of multiple myeloma was made.

	References	% of pacientes	Scores
Proteinuria	6	88	+15
ESR >20 mm/h	4	84	+15
Bone lesions	12,22	80	+14
Normocytic/normochromic anemia	4,6,12	73	+13
Vertebral fracture	9	70	+12
Bone pain	4,12	58	+10
Fatigue	4	32	+6
Weight loss	4	24	+4
Renal failure (creatinine ≥ 2 mg/dl)	4,5,10	21	+4
Hypercalcemia (corrected calcium >11 mg/dl)	7	21	+4
Platelets number changes	4	7	+1
Paresthesias	4	5	+1
Fever	4	1	+1
Total		564	+100

the complementary diagnostic exams follow, in order to exclude or confirm the possible initial clinical diagnoses.

A scoring system can be useful to compare the possibilities of each differential diagnosis with each other. In the case of multiple myeloma, the higher the total score found, the greater the chance of actually being multiple myeloma.

However, in the opinion of the authors, just the fact that the doctor has in mind the existence of a scoring system for a given disease, already makes this doctor think about the possibility of this disease.

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