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Global Geriatric Assessment in Elderly Patients Aged 65 Years and Over in Internal Medicine at the University Hospital Center of the Point G, Bamako, Mali: An Observationnal Cross-Sectional Prospective Hospital-Based Study

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Abstract **Original Research Article**

Introduction: The objective of this study was to thoroughly evaluate the elderly patients aged 65 years and over on all his dimensions, medical, psychological, social and functional capacity. ***Methodology*:** This was an observational cross-sectional and descriptive study with prospective data collection for 13 months (May 2012 to May 2013) including all consenting subjects aged 65 years and older of both sexes hospitalized in the department Internal Medicine Department at the University Hospital Center of the Point G. ***Results:*** Overall, during the study period, 422 patients were hospitalized among which 80 subjects aged at least 65 years (19%). In terms of socio-demographics, patients aged 65 years and over came in second place with 19% of cases (n= 35). Among the elderly patients in our study, the average age of our elderly patients was 73.8 ± 7.4 years with extremes of 65 and 99 years. The male sex represented 67.5% with a male-to-female sex ratio of 2.07. Clinically, the digestive signs were the main reason for hospitalization of elderly patients with 17.1% of cases, followed by the skin sign with 14.7% of cases, and the hematological sign with 13.2% of cases. Concerning the diagnoses retained, the most frequent pathologies in our elderly patients were infectious and tropical pathologies with 23.3% of cases: urogenital infection (n=14), malaria (n=12), extra-pulmonary and pulmonary tuberculosis (n=7), superinfected COPD (n=4); digestive pathologies with 21.8% of cases: gastric pathology (n=16) hepatopathy (n=15), esophageal pathology (n=6); cardiovascular pathologies with 15.6% of cases: vascular pathology (n=16), cardiac pathology (n=14); Tumor pathologies with 15.0% of cases: malignant tumor without metastasis (n=14), malignant tumor with metastasis (n=8). Elderly patients with a single diagnosis were the most observed in 38.8%, followed by 22.5% of cases with 3 diagnoses. At the standardized geriatric assessment, regarding the evaluation of the social environment, about 72% of the elderly patients had a couple life and only 2 cases of solitary life. The assistance provided to the elderly patients at home accounted for 97.5% of the cases by a third person. At the psycho-social evaluation, according to the global score of the Folstein Mini Mental, nearly 70% of the elderly patients did not present any cognitive deficit against approximately 30% of suspicion. According to the Geriatric Depression Scale, 4.4% of the elderly patients were at risk of depression. In the assessment of nutritional status, according to the Mini-Nutritional Assessment scale, the majority of elderly patients were at risk of poor nutritional status in 95.7% of cases. In the assessment of walking and balance, the timed Up and Go test was abnormal

in 42.6% and the unipodal station test was abnormal in 63.0% of elderly patients. In the evaluation of the degree of functional autonomy according to the ADL, 68.8% of the elderly patients lost their functional autonomy against 31.2% and according to the IADL, 90.0% of the elderly patients were not autonomous against 10.0% of the contrary cases. In terms of therapy, the 4 main therapeutic classes were antibiotics and antituberculosis drugs (82.5% of cases) dominated by amoxicillin-clavulanic acid (36.7% of antibiotics); antihypertensive drug (55.0% of cases) by diuretics (17.0% of cases); the antiplatelet aggregation and anticoagulant drug (45.7% of cases) by aspirin (n= 9) and the corticoid with adjuvant treatment or not and analgesic (50.0% of cases) by prednisone (n= 15). Among the elderly patients hospitalized, those using 4 or more drugs were the most numerous, with extremes of 1 and 7. In terms of evolution, 30.0% of elderly patients died. Pleuropulmonary, infectious and cardiovascular pathologies were the 3 major causes of death in elderly patients. ***Conclusion:*** Our study shows that elderly people, mostly males, are frequently hospitalized in internal medicine. The reason for hospitalization is dominated by the digestive sign, the cutaneous and the hematological sign. The most frequent pathologies encountered in our elderly patients were infectious and tropical pathologies, digestive pathologies, cardiovascular pathologies and tumor pathologies. About two thirds of the elderly patients are polypathological and the majority of these elderly patients are polymedicated with the use of more than 4 drugs. These are mainly antibiotics and anti-tuberculosis drugs, antihypertensive drugs, antiplatelet aggregation and anticoagulant drugs. The mortality rate is high and most often due to pleuropulmonary, infectious and cardiovascular pathologies. These elderly patients, mostly living in couples, present a high risk of cognitive deficit, a low risk of depression, a very high risk of poor nutritional status, a high risk of falling and a loss of functional and instrumental autonomy in a significant proportion.
Keywords: Global geriatric assessment, standardized comprehensive geriatric assessment, Elderly patient, internal medicine, Mali.

INTRODUCTION

The global geriatric approach is defined as an interdisciplinary multidimensional diagnostic process that seeks to evaluate the frail elderly person in his medical, psychological, social and functional capacity dimensions with the objective of developing a coordinated and integrated plan of treatment and long-term follow-up. The central notion of this approach is the systematization of multidimensionality and interdisciplinarity that makes it possible to generate a global and coordinated care plan, that is more efficient than the usual hospital care of the elderly, particularly in the identification and management of geriatric syndromes, fragility syndromes, vulnerability factors as comorbidities in the elderly [1-3].

Indeed, the elderly constitute a heterogeneous population of subjects aged 60 and over. We are increasingly witnessing the progressive rectangularization of the age pyramid in the world. Thus, according to WHO, the number of people over 60 years old should double by 2050 [4]. In Mali, according to the National Direction of Statistics and Informatics (DNSI), the average growth rate of people aged 60 and over rose from 0.09% in 1987 to 4.3% in 2004 and this age group will be 2.980.000 or 7% of the total population by 2050 [5].

However, the aging of the population and the increase in the number of elderly people will be accompanied by an increase in the prevalence of certain diseases and loss of autonomy, in parallel with a resurgence of several chronic diseases linked in part to lifestyle habits. Consequently, hospital services are confronted with the medical and social consequences of this demographic evolution, particularly the Internal Medicine service which is seeing more and more elderly people arrive. Thus, according to a study conducted from 2004 to 2008 in the Internal Medicine department, the over 60 years of age represented 21% of hospitalized patients [6]. According to another study carried out in 2012 in three health centers in Bamako, 55% of stroke cases affected people over 60 years of age [7].

Although works comparing specific geriatric approaches to the "usual" practice of hospital medicine demonstrates the efficiency of global geriatric assessment. Few studies have been devoted to global geriatric assessment in Africa and more particularly in Mali [8]. Thus, the objective of this present work carried out in the specialized department of Internal Medicine was to thoroughly evaluate the elderly patients aged 65 years and over on all his dimensions, medical, psychological, social and functional capacity.

METHODOLOGY

This was an observational, cross-sectional and descriptive study with prospective data collection for thirteen months (May 2012 to May 2013) in the Internal Medicine Department at the University Hospital Center of the Point G. The study included all patients hospitalized in the Internal Medicine Department during the study period. All patients aged 65 years and older were considered as statistical units. All consenting patients aged 65 years and over of both sexes, hospitalized in the department during the study period were included in this study. The discharge diagnosis was considered as the retained diagnosis. Thus, each patient had at least one diagnosis retained depending on

the case. In the absence of an autopsy, the retained diagnoses were taken as the cause of death. The followings were excluded from our study: patients under 65 years of age; patients 65 years of age and older who were not hospitalized; subjects who met the inclusion criteria but did not consent; patients hospitalized outside the study period; patients hospitalized in other departments at the University Hospital Center of the Point G. We conducted a comprehensive sampling including all elderly patients hospitalized from May 2012 to May 2013 and the minimum sample size was estimated to be 80 or more elderly patients. We reviewed the registries and all inpatient records of the Internal Medicine Department to collect additional information as needed. The data of the clinical and psycho-social evaluation as well as the retained diagnosis, the treatment undertaken and the evolution were mentioned as measured variables, directly in the majority of the cases on a pre-established standardized individual survey form. The data were transferred, processed and analyzed on the computer using SPSS 16.0 and EPI604 for Windows. Pearson's Chi-square statistical test, or Yates' correction, or Fisher's exact test for categorical variables and Student's for quantitative or continuous variables were used for comparisons with $P < 0.05$ set as the significance level. The results were presented in text, tables and graphs using Microsoft World 2007 and Microsoft Excel 2007 software after word processing. The realization of our survey required the authorization of the Head of University Hospital Center of the Point G (UHC Point G). We sent letters to him to explain the interest of our study and the authorization of the Medical Committee of Establishment (CME) and of the administration of University Hospital Center of the Point G. We also had the informed consent of the patients interviewed and concerned by the survey or of their families (in case of major handicap), without compensation. All the persons subjected to the questionnaire were informed of the purpose and the procedure of the interview with the guarantee of total anonymity and confidentiality of the results, materialized by the use of password for the database.

RESULTS

Globally, during the study period (May 2012 to May 2013), 422 patients were hospitalized among which 80 patients aged at least 65 years (19%) were investigated on socio-demographic, clinical, psychosocial, functional capacity, therapeutic and evolutionary characteristics.

In terms of socio-demographics, patients aged 65 years and over came in second place with 19% of cases (n= 35). Among the elderly patients in our study, those in the 70-74 age group were the most common with 31.2% of cases, followed by the 65-69 age group with 30% of cases. The mean age of our elderly patients was 73.8 ± 7.4 years with extremes of 65 and 99 years. The male sex represented 67.5% with a sex ratio M/F of 2.07. Only in the age group of 70-74 years, the most represented in our study with 31.2%, that both sexes were close with a ratio M/F of 1.08 (table I). Clinically, the digestive signs were the main reason for hospitalization of elderly patients with 17.1% of cases, followed by the skin signs with 14.7% of cases, and the hematological signs with 13.2% of cases (Figure 1). A patient may have one or more functional signs.

Concerning the retained diagnoses, the pathologies most encountered in our elderly patients were infectious and tropical pathologies with 23.3% of cases: urogenital infection (n=14), malaria (n=12), extra-pulmonary and pulmonary tuberculosis (n=7), superinfected COPD (n=4); digestive pathologies with 21.8% of cases: gastric pathology (n=16) hepatopathy (n=15), esophageal pathology (n=6); cardiovascular pathologies with 15.6% of the cases: vascular pathology (n=16), cardiac pathology (n=14); tumoral pathologies with 15.0% of the cases: malignant tumor without metastasis (n=14), malignant tumor with metastasis (n=8) (Table II). Elderly patients with a single diagnosis were the most observed in 38.8%, followed by 22.5% of cases with 3 diagnoses (Figure 2). Thus, the main infectious pathologies were urogenital infections, followed by malaria, which occurred in its simple form in 83.3% of cases of malaria in the elderly (Table IV). Gastropathies and hepatopathies were the most represented digestive diseases with a predominance of gastritis in 21.4% of cases and 56.2% of gastropathies (Table V). While vascular disease dominated cardiac disease; dilated cardiomyopathy was the most represented with 20.0% of cases, of which 10.0% were of the hypokinetic type with impaired left ventricular ejection fraction (LVEF) (<50%), as well as for hypertension, arterial pulmonary hypertension and thrombosis. Dilated cardiomyopathy was the most frequent cardiopathy with 42.8% (of which 21.4% were of the hypokinetic type with impaired LVEF) and hypertension dominated as many times as arterial pulmonary hypertension, and the thrombosis dominated the vascular pathologies with 18.7% (Table VI). Malignant tumors without metastasis were dominated by hepatocellular carcinoma with 17.5% of cases followed by gastric neoplasia with 10.3% of cases as well as malignant tumors with metastasis by prostate adenocarcinoma with bone metastasis, 10.3% of cases. On the other hand, prostate adenoma was the most common benign tumor with 14.0% of cases (Table VII). Uncomplicated type 2 diabetes and complicated by hyperosmolarity, and diabetic foot accounted for more than 69.2% of cases of endocrine and metabolic disorders (Table VIII). Lumbodiscarthrosis was the most common osteoarticular disease in the elderly, followed by infectious gonarthritis with 20% of cases (Figure 3). Renal disease of unspecified etiology and renal lithiasis were the most represented urogenital conditions with 44.4% each (Table IX). Cerebral atrophy was observed in more than 60% of cases followed by dementia with 27.3% of cases (Table X). In

total, in the first rank of the 11 pathologies most frequently encountered in elderly patients in our series were urogenital infection with 14 cases (19.0%) followed by diabetes and gastritis with 9 cases each (12.2%), cardiomyopathy with 8 cases (10.8%) (Table III).

At the standardized geriatric assessment, concerning the evaluation of the social environment, about 72% of the elderly patients had a couple life and only 2 cases of solitary life. The assistance provided to the elderly patients at home accounted for 97.5% of the cases by a third person; household help (60.0%); meal assistance (25.0%) (Table XI). In the psycho-social evaluation, according to the global score of the mini mental of Folstein, the maximum of the patients (17,5%) subjected to the exercise of this scale obtained a score of 27 points against 7,3% of better score of 30 points. As for the interpretation of the Folstein Mini Mental status scale (MMS), nearly 70% of the elderly patients did not present a cognitive deficit against approximately 30% of suspicion (Table XII). According to the clock test, there were nearly 9% of suspected dementia cases in the elderly (Table XIII). According to the 5-word test, there were 7.4% of suspected dementia cases versus 92.6% (Table IV). According to the Geriatric Depression Scale, 4.4% of the elderly patients were at risk for depression (Table XV). In the assessment of nutritional status, according to the mini-nutritional assessment scale, the majority of elderly patients were at risk of poor nutritional status in 95.7% of cases (XVI). In the assessment of walking and balance or risk of falling, the timed Up and Go test was abnormal in 42.6% and the unipodal station test was abnormal in 63.0% in elderly patients (XVII). There was 35.0% of amyotrophy and 25.0% of the presence of the Tabouret sign in elderly patients. In the evaluation of the degree of functional autonomy according to the ADL, 68.8% of the elderly patients lost their functional autonomy against 31.2% and according to the IADL, 90.0% of the elderly patients were not autonomous against 10.0% of the contrary cases (XVIII).

Therapeutically, the 4 main therapeutic classes were antibiotics + anti-tuberculosis drugs (82.5% of cases) dominated by amoxicillin-clavulanic acid (36.7% of antibiotics); anti-hypertensives (55.0% of cases) by diuretics (17, % of cases); the combination of anti-platelet aggregators and anti-coagulants (45.7% of cases) by aspirin (n= 9); and the combination of corticoid with adjuvant treatment + analgesic (50.0% of cases) by prednisone (n= 15) (Table XIX, Table XIX continued). Among the elderly hospitalized patients, those using 4 or more drugs were the most numerous with extremes of 1 and 7.

In terms of evolution, 50.0% of the elderly patients had a favourable evolution; death (30.0% of cases) and discharge against medical advice (8.8% of cases) including cases of escape (2.5%) (Table XX). Pleuropulmonary, infectious and cardiovascular pathologies were the 3 major causes of death in elderly patients hospitalized in the Internal Medicine Department at the University Hospital Center of the Point G (XXI).

Table I: Distribution of elderly patients by age and gender

Age group	Gender				Total	
	Female		Male			
	N	%		%		%
65-69 years old	5	19.2	9	35.2	4	30
70-74 years old	12	46.2	3	24	5	31.2
75-79 years old	5	19.2		16.7	4	17.6
80-84 years old	2	7.7		11.1		10
85 years and older	2	7.7		13		11.2
Total	26	100	4	100	0	100

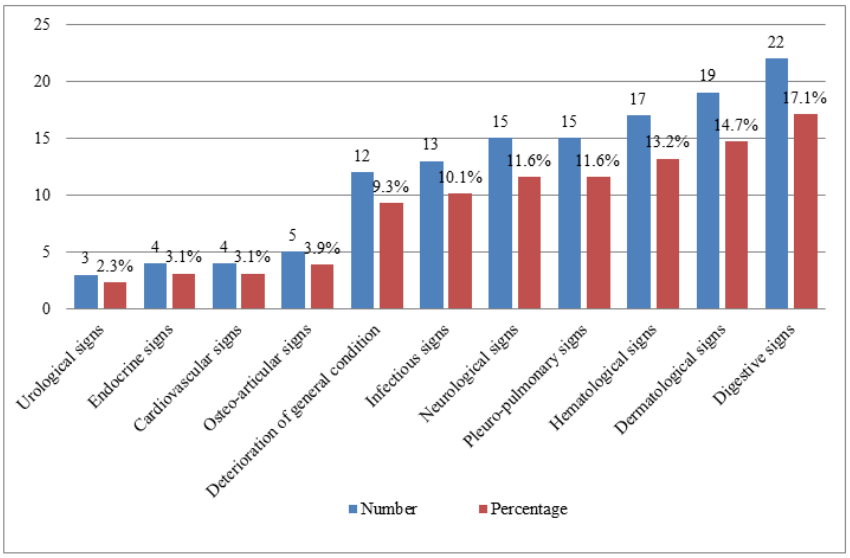

Figure 1: Distribution of cases by reason for hospitalization

Table II: Distribution of elderly patients according to the diagnoses retained

Diagnoses retained		Number	Percentage
Infectious and tropical pathology (n= 45 cases; 23.3% of cases)	Urogenital infection	14	7.3
	Malaria	12	6.2
	Extra and pulmonary tuberculosis	7	3.6
	Superinfection on COPD	4	2.1
	Sepsis	3	1.6
	Bacterial meningitis	2	1.0
	Skin infection	2	1.0
	HIV2	1	0.5
Digestive pathology (n= 42 cases; 21.8% of cases)	Gastric pathology	16	8.3
	Hepatopathy	15	7.8
	Esophageal pathology	6	3.1
	Intestinal pathology	3	1.6
	Proctological pathology	2	1.0
Cardiovascular pathology (n= 30 cases; 15.0% of cases)	Vascular pathology	16	8.3
	Cardiac pathology	14	7.3
Tumoral pathology (n= 29 cases; 15.0% of cases)	Malignant tumor without metastasis	14	7.3
	Malignant tumor with metastasis	8	4.1
	Benign tumor	7	3.6
Endocrine and metabolic pathology (n= 13 cases; 6.7% of cases)		13	6.7
Pyschoaffective pathology (n= 11 cases; 5.7% of cases)		11	5.7
Osteo-articular pathology (n= 10 cases; 5.2% of cases)		10	5.2
Non-infectious urogenital pathology (n= 9 cases; 4.7% of cases)		9	4.7
Hematological pathology (n= 3 cases; 1, 6% of cases)	Anemia	3	1.6
Pleuropulmonary pathology (n= 2 cases; 1.0% of cases)	Post-smoking COPD	1	0.5
	Hematic pleurisy	1	0.5
Total		193	100.0

Table III: Distribution of the most frequent pathologies observed in elderly patients

Most frequent pathologies	Number	Percentage
Urogenital infection	14	19.0
Type 2 diabetes	9	12.2
Gastritis	9	12.2
Cardiomyopathy	8	10.8
Cerebral atrophy	7	9.4
Post-hepatitis B cirrhosis	6	8.1
Hepatocellular carcinoma	5	6.7
Prostate adenocarcinoma with metastasis	4	5.4
Prostate adenoma	4	5.4
Lumbar disc disease	4	5.4
Kidney disease	4	5.4
Total	74	100.0

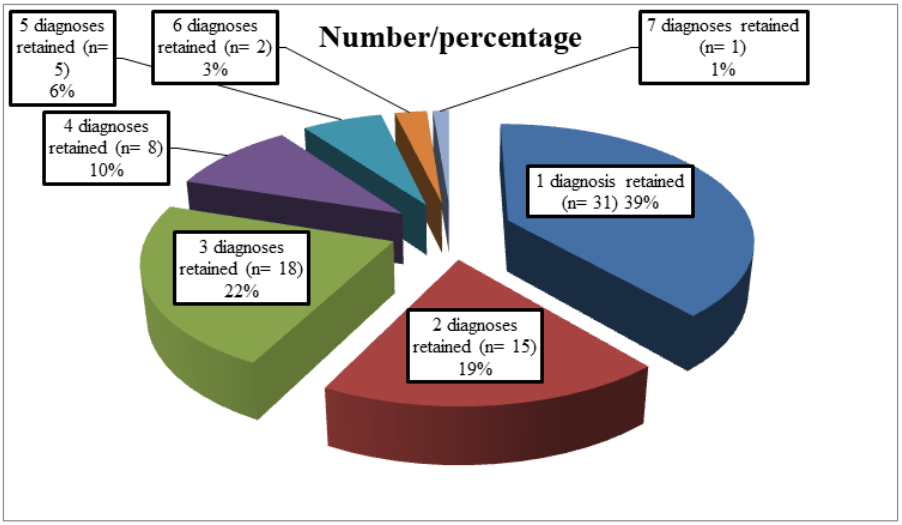

Figure 2: Distribution of patients according to the number of diagnoses retained per patient

Table IV: Distribution of elderly patients by infectious and tropical diseases

Infectious and tropical diseases			**Number**	**Percentage**
Urogenital infection (n= 14 cases; 31.1% of cases)	*Escherichia coli*		5	11.2
	Streptococcus	*not groupable*		
		coagulase negative	2	4.4
	Pseudomonas aeruginosa		1	2.2
	Pyelonephritis		1	2.2
	Germ-free leukocyturia		5	11.2
Malaria (n= 12 cases; 26.7% of cases)	Uncomplicated malaria		10	22.3
	Severe malaria		2	4.4
Pulmonary and extra pulmonary tuberculosis (n= 7 cases; 15.6% of cases)	Multifocal	Ganglion and hematopoietic	3	6.7
		Lung and peritoneal		
		Lung, lymph node and spine		
		Miliary	2	4.4
	Pulmonary		1	2.2
	Peritoneal		1	2.2
COPD superinfection (n= 4 cases; 8.9% of cases)			4	8.9
Sepsis (n= 3 cases; 6.7% of cases)			3	6.7
Bacterial meningitis (n= 2 cases; 4.4% of cases)			2	4.4
Skin infection (n= 2 cases; 4.4% of cases)	Recurrent erysipelas of the lower limbs			
	Bullous dermatosis		2	4.4
HIV2 (n= 1 case; 2.2% of cases)			1	2.2
Total			45	100.0

Table V: Distribution of elderly patients according to digestive pathologies

Digestive pathologies		**Number**	**Percentage**
Gastropathy (n= 16 cases; 38.1% of cases)	UGD	3	9.5
	Cratered antral ulcer	1	
	Erythematous antritis	2	14.3
	Fundial petechial gastropathy	2	
	Erosive petechial pangastropathy	1	
	Purpuric gastropathy	1	
	Chronic *H. pylori* gastritis	1	7.1
	Chronic atrophic gastritis	1	
	Chronic ganular gastritis	1	
	Pyloric hernia	1	2.4
	Atrophic bulbitis	1	4.8
	Erythematous bulbitis	1	
Hepatopathy (n= 15 cases; 35.7% of cases)	Post-hepatitis B cirrhosis	6	14.3
	Hepatitis B	4	9.5
	Hepatic steatosis	3	7.1
	Unspecified chronic liver disease	1	2.4
	Hepatic abscess	1	2.4
Esophageal pathology (n= 6 cases; 14.3% of cases)	Esophagitis	3	7.1
	Cardial gaping	2	4.8
	Hiatus hernia	1	2.4
Intestinal pathology (n= 3 cases; 7.1% of cases)	Colic polyposis	1	7.1
	Deepening ulceration of the sigmoid	1	
	Diarrheal disease of undetermined origin	1	
Proctological pathology (n= 2 cases; 4.8% of cases)	Hemorrhoidal disease	2	4.8
Total		42	100.0

Table VI: Distribution of elderly patients according to cardiovascular pathologies

Cardiovascular pathologies				Number	Percentage
Vascular disease (n= 16 cases; 53.3% of cases)	Arterial hypertension			3	10.0
	Arterial pulmonary hypertension			3	10.0
	Ischemic stroke			2	6.7
	Pulmonary embolism			2	6.7
	Arteritis of the lower limbs			2	6.7
	Thrombosis	Lower limb		2	10.0
		Hemorrhoidal		1	
	Venous insufficiency of the lower limb			1	3.3
Cardiac condition (n= 14 cases; 46.7% of cases)	Cardiomyopathy	Dilated	Hypokinetic with impaired LVEF	3	20.0
			Of anemic origin	1	
			Ischemic	1	
			Restrictive mixed	1	
		Hyperkinetic		2	6.6
	Heart failure	Of undetermined origin		2	13.3
		Mitral		1	
		Cardiac liver		1	
	Myocardial infarction (MI)			1	3.3
	Pericarditis			1	3,3
Total				30	100.0

Table VII: Distribution of elderly patients by tumoral pathologies

Tumoral pathologies		Number	Percentage
Tumor without metastasis (n= 14 cases; 48.3% of cases)	Hepatocellular carcinoma	5	17.5
	Gastric neoplasia	3	10.3
	Prostatic adenocarcinoma	2	6.9
	Pancreatic cystadenocarcinoma	1	3.4
	Chronic lymphocytic leukemia	1	6.9
	Multiple myeloma	1	
	Rectal tumor	1	3.4
Tumor with metastasis (n= 8 cases; 27.6% of cases)	Prostate adenocarcinoma with bone metastasis	3	10.3
	Prostate adenocarcinoma with bone and lung metastases	1	3.4
	Adenocarcinoma of the colon with thoracic metastasis	1	3.4
	Adenocarcinoma of the colon with liver and lymph node metastases	1	3.4
	Bilateral renal tumor with pulmonary metastasis	1	3.4
	Undetermined primary cancer with medullary metastasis	1	3.4
Benign tumor (n= 7 cases; 24.1% of cases)	Prostate adenoma	4	14.0
	Gastric tumor	1	6.9
	Cardiac stenosing tumor	1	
	Lung tumor	1	3.4
Total		29	100.0

Table VIII: Distribution of elderly patients according to endocrine and metabolic diseases

Endocrine and Metabolic diseases		Number	Percentage
Type 2 Diabetic foot	Right	2	30.8
	Left	2	
Uncomplicated type 2 diabetes		4	38.4
Type 2 diabetes complicated by hyperosmolarity		1	15.4
Hyperthyroidism		2	7.7
Undernutrition		1	7.7
Acute adrenal insufficiency		1	100
Total		13	

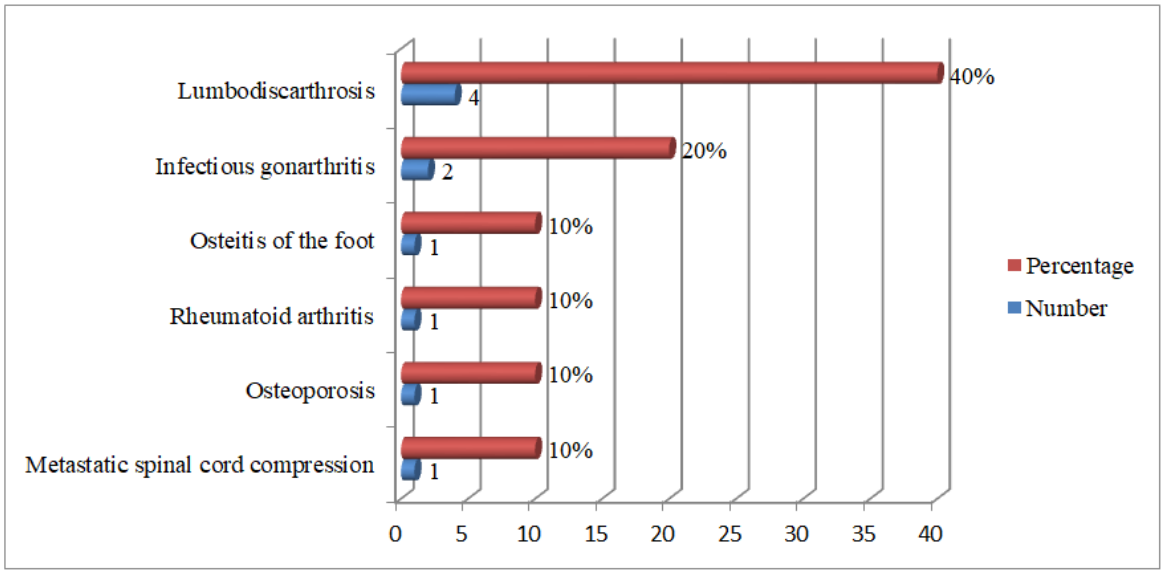

Figure 3: Distribution of elderly by osteo6articular pathologies

Table IX: Distribution of the elderly according to non-infectious urogenital pathologies

Non-infectious urogenital pathologies		Number	Percentage
Kidney disease	Acute	2	22.2
	Chronic	2	22.2
Renal lithiasis		2	22.2
Bilateral hydrocele		1	11.1
Renal cyst		1	11.1
Hematuria		1	11.1
Total		9	100.0

Table X: Distribution of elderly patients by cerebral pathologies

Cerebral pathologies		Number	Percentage
Cerebral atrophy		7	63.6
Dementia	Other than Alzheimer's	2	18.2
	Alzheimer's disease	1	9.1
Hypertensive encephalopathy		1	9.1
Total		11	100.0

Table XI: Distribution of Elderly Patients by Home Support from the Social File

Home Help	Number	Percentage
Third party	78	97.5
Household help	48	60.0
Meal assistance	20	25.0
Nurse	0	0
Physiotherapy	0	0
Remote alarm	0	0
Personalized autonomy allowance	0	0
Other assistance	0	0

Table XII: Distribution of cases according to the global score of the Folstein Mini Mental (MMS)

Overall score of the Folstein Mini Mental/ Interpretation of the Folstein Mini Mental status	Number	Percentage
Overall score of the Folstein Mini Mental		
8 points	1	1.4
10 points	1	1.4
13 points	1	1.4

14 points	1	1.4
15 points	1	1.4
16 points	2	2.9
18 points	2	2.9
19 points	1	1.4
20 points	3	4.3
21 points	2	2.9
22 points	1	1.4
23 points	4	5.8
24 points	7	10.2
25 points	9	13.1
26 points	2	2.9
27 points	12	17.5
28 points	10	14.6
29 points	4	5.8
30 points	5	7.3
Total	69	100.0
Interpretation of the Folstein Mini Mental status		
Unsuspected cognitive deficit	48	69.6
Suspected cognitive impairment	21	30.4
Total	69	100.0

Table XIII: Distribution of patients according to the score of the clock test (dementia)

Clock Test Scale Score / Interpretation of the clock test scale	Number	Percentage
Clock Test Scale Score		
0 points	2	6.2
2 points	1	3.1
3 points	3	9.4
4 points	26	81.3
Total	32	100.0
Interpretation of the clock test scale		
No suspicion of dementia	29	90.6
Suspected dementia	3	9.4
Total	32	100.0

Table XIV: Distribution of cases according to the score of the Dubois 5-word test

Dubois 5-Word Test Scale Score/ Interpretation of the 5-word test scale	Number	Percentage
Dubois 5-Word Test Scale Score		
10 points	19	28.0
9 points	15	22.0
8 points	14	20.6
7 points	12	17.6
6 points	3	4.4
5 points	4	5.9
3 points	1	1.5
Total	68	100.0
Interpretation of the 5-word test scale		
No suspicion of dementia	63	92.6
Suspicion of dementia	5	7.4
Total	68	100.0

Table XV: Distribution of patients according to the interpretation of the GDS (Geriatric Depression scal)

Interpretation GDS (Geriatric Depression scal)	Number	Percentage
No risk of depression	66	95.6
Risk of depression	3	4.4
Total	69	100.0

Table XVI: Distribution of patients according to nutritional status assessment using the Mini Nutritional Assessment (MNA) scale

Mini-MNA Scale	Number	Percentage
Undernutrition (Score < 12 points)	44	95.7
Normal (Score >= 12 points)	2	4.3
Total	46	100.0

Table XVII: Distribution of patients by gait and balance tests in the context of fall risk

Gait and balance tests		Number	Percentage
Test timed Up and Go	Normal	27	57.4
	Abnormal	20	42.6
	Subtotal	47	100.0
Test station unipodal	Abnormal	29	63.0
	Normal	17	37.0
	Subtotal	46	100.0

Table XVIII: Distribution of cases by functional Autonomy, Activity of Daily Living (ADL) and Instrumental Activity of Daily Living (IADL)

Activity of Daily Living (ADL) Instrumental Activity of Daily Living (IADL) sub-items and their interpretations	Number	Percentage
Activity of Daily Living (ADL) sub-items		
Walk	27	33.8
Transfer	21	26.2
Meals	60	75.0
Washing	16	20.0
Dressing	37	46.2
Continence	72	90.0
Interpretation of the ADL		
Dependent	55	68.8
Autonomous	25	31.2
Total	80	100.0
Instrumental Activity of Daily Living (IADL) sub-items		
Call	57	71.2
Taking medication	62	77.5
Doing your accounts	8	10.0
Take a means of transportation	3	3.8
Interpretation of the IADL		
Dependent	72	90.0
Autonomous	8	10.0
Total	80	100.0

Table XIX: Distribution of Elderly patients according to administered drugs

Drugs			Number		Percentage
Antibiotic and Antituberculosis drugs (n= 33 cases; 82.5% of cases)	Amoxicillin clavulanic acid		11		27.5
	Amoxicillin		5		12.5
	Metronidazole		4		10.0
	Ciprofloxacin		4		10.0
	Ceftriaxone		3		7.5
	Norfloxacin		1		2.5
	Pristinamycin		1		2.5
	Fucidic acid		1		2.5
	Anti-tuberculosis drugs		3		7.5
Antihypertensive drug (n= 22 cases; 55.0% of cases)	Diuretic	Furosemide	4	7	17.5
		Spirinolactone	2		
		Indapamide	1		

	Calcium inhibitor	Amlodipine	3	6	15.0
		Nifedipine	3		
	ACE inhibitor	Captopril	5		12.5
	Beta Blocker	Propanolol	2	4	10.0
		Atenolol	2		
Antiplatelet aggregation and anticoagulant drugs (n= 19 cases; 47.5% of cases)	Heparin	Enoxaparin	6	7	17.5
		Calciparin	1		
	Aspirin		9	10	25.0
	Naftidrofuril		1		
	Antivitamin K drug	Fluindione	2		5.0
		Acenocoumarol			
Corticosteroid with adjuvant therapy or not, and analgesic (n= 20 cases; 50.0% of cases)	Corticosteroid with adjuvant therapy	Prednisone and adjuvant therapy	15		
	Corticoid	Dexamethasone	1	16	40.0
	Analgesic	Paracetamol	2	4	10.0
		Tramadol	2		

Table XIX (continued): Distribution of Elderly patients according to administered drugs

Drugs		**Number**		**Percentage**
Antiulcer drug and digestive dressing (n= 7 cases; 17.5% of cases)	Omeprazole	6	7	
	Diosmectite	1		17.5
Vitamins and other supplements (n= 8 cases; 20.0% of cases)	B12	2	8	20.0
	Vitamin D and Calcium	2		
	Potassium	2		
	Poly-vitamin complex	1		
	Magnesium	1		
Antidiabetic drug (n= 5 cases; 12.5% of cases)	Insulin	5		12.5
Blood transfusion, iron, and folic acid use (n= 5 cases; 12.5% of cases)	Blood transfusion	4		
	Iron and folic acid	1		12.5
Rehydration (n= 7 cases; 17.5% of cases)	Infusion	5		12.5
	Oral salt supplementation	2		5.0
Statin (n= 5 cases; 12.5% of cases)	Simvastatin	5		12.5
Antimalarial drug (n= 5 cases; 12.5% of cases)	Quinine	3		7.5
	Artesunate	2		5.0
Mucolytic and bronchodilator (n= 3 cases; 7.5% of cases)	Acetylcisteine	2		5.0
	Carbocysteine			
	Theophylline	1		2.5
Laxative and antiemetic drug (n= 4 cases; 10.0% of cases)	Lactulose	2		
	Domeperidone	2	4	10.0
Neuroleptic and antidepressant drug (n= 2 cases; 5.0% of cases)	Chlorpromazine			
	Amytriptiline	2		5.0
Other treatments (n= 6 cases; 15.0% of cases)	Carbimazole, kabiven, Phloroglucinol, amputation, surgeries	6		15.0

Table XX: Distribution of cases according to the evolution of elderly patients

Evolution	**Number**	**Percentage**
Favorable	40	50.0
Deaths	24	30.0
Discharge against medical advice	7	8.8
Stationary	6	7.5
Transfer to referral services	2	2.5
Complication	1	1.2
Total	80	100.0

Table XXI: Distribution of elderly patients by cause of death

Cause of death		Number	Percentage
Pleuropulmonary disease (n= 5 cases; 20.8% of cases)	Respiratory distress	3	12.5
	Acute respiratory distress	1	4.2
	Probable acute pulmonary oedema	1	4.2
Infectious disease (n= 4 cases; 16.7% of cases)	Probable sepsis	2	8.3
	Infectious context	1	4.2
	Persistent fever	1	4.2
Cardiovascular disease (n= 3 cases; 12.5% of cases)	Cardiovascular arrest	2	8.3
	Cardiovascular collapse	1	4.2
Neurological condition (n= 2 cases; 8.3% of cases)	Alteration of consciousness with fever	1	4.2
	Hepatic encephalopathy	1	4.2
Deterioration in general conditions (n= 2 cases; 8.3% of cases)	Weight loss, physical asthenia, anorexia	2	8.3
Hematological condition (n= 1 case; 4.2% of cases)	Hemorrhage (rectal and urogenital)	1	4.2
Unknown cause (n= 6 cases; 29.2% of cases)	Sudden death	1	4.2
	Unknown	6	25.0
Total		24	100.0

DISCUSSION

Methodological aspects

This was a first prospective study in Mali, from May 2012 to May 2013, including all patients aged at least 65 years hospitalized in the Internal Medicine Department at the University Hospital Center of the Point G, with the aim of evaluating them on all medical, psychosocial, and functional capacity dimensions. Our study had a number of limitations: i) the small sample size of 80 elderly patients (certainly dependent on the length of the survey) leading to difficulties with statistical tests, so a selection bias ii) The long time required for each elderly subject to complete the clinical examination, including the selected validated scales, often leading to a loss of concentration and/or patience, which can cause information bias iii) some of these validated scales, adopted in our series, such as the clock test, the 5 words test, MNA, DGS, ADL and IADL are mini-scales that become outdated and obsolete versus the complete and longer scales, leading often confusion bias iv) fragility in itself was a significant handicap preventing some people from comfortably taking the examination for a long time, as required by the doctor v) some etiologies are retained without confirmation on the basis of the most obvious diagnostic orientation, for various reasons which are, among others, financial and economic for the most part, absence or insufficiency of technical facilities but also cases of early death and discharge of patients against medical advice, which can induce also confusion bias. In spite of these difficulties, which were overcome with determination, we obtained rich and satisfactory results in documenting the evaluation of the elderly patients on various dimensions in the Internal Medicine Department.

Overall results

During 13 months, a total of 422 patients were hospitalized among which 80 patients aged 65 years and over, i.e. a frequency of 19%. This result varied according to the data in the literature: Nguema [9], Tolo [10], Moghomaye [11], and Sanogo [12] in Mali reported respectively 1,628 (9.12%), 199 (23.35%), 174 (30.85%), and 174 (30.85%), and in France, Carresco reported a rate of 15% [13]. This difference could be explained by the size of the elderly patients, the variation in the threshold for the age of the elderly subject chosen, the duration of the study, the turnover rate of the hospital beds and especially the study site.

Socio-demographic aspects

Age

The mean age was 73.8 years with extremes of 65 and 99 years. This result was comparable to that of Tolo [10] and Moghomaye [11] who reported a mean age of 72.14 ± 7.67 years and 75 years respectively. On the other hand, these data are lower than those found in other studies in the West, Turpin in Nice and Legrand-Barissat in Paris found respectively a mean age of 79.8 +/- 6.3 years and 88 +/- 8.2 years [14, 15] and 82.2 +/- 7.2 according to Lafortune in Paris [16] at time T0 of departure, Thi [17] found a mean age of 86 +/- 7 years (extremes 70-103 years), for Bourdaud-Briand [18] in Nantes, it was 83.6 years (extremes 75-95 years) Beyne-Ranzy [19] and Roth [20] reported 85.8 and 89.5 years respectively as the average age. This difference can be explained by the fact that these studies are European, where life expectancy is higher, but also by the fact that their population is aging.

Gender

In our series, males predominated (67.5%) with a male-to-female sex ratio of 2.07, consistent with certain studies in the literature [21; 8; 11; 10; 9] in Mali,

which had a male-to-female sex ratio of 2.74; 2.1; 1.94; 1.71; 1.5, respectively, and inconsistent with that of Niane [22], which had a female-to-male sex ratio of 1.70. In other studies, and especially in Europe, the predominance of women is rather higher, as shown by Turpin [14], Drame [23], Thi [17], Lafortune [16] at T0, Legrand-Barissat [15] and Bourdaud-Briand [18], respectively at 1.7; 1.8; 1.96; 2.43; 3 and 6.5. This difference is due to the existence of policies for the protection, promotion and emancipation of Western women, which places their life expectancy above that of men, hence the predominance of senescence. In Mali, the expression of the various diseases and/or risk factors of the senility as the result of the burden of social charges supported by men could explain the sex ratio in favor of men.

Clinical aspects

Reason for hospitalization

During our study, various reasons, most often 2, were expressed by the patients at their admission. It was found that the digestive sign was the most expressed reason with 17.1% of cases. This is comparable to the result of Fomba [6], for all ages, in which hepato-gastro-enterological pathology was the most common with 35.27% of cases. On the other hand, altered consciousness was the most common in the studies of Mengue - ME - Nguema [9] 18% and Tchoua [24] with 38% of cases. In 1998, in Tunisia, a study on hospital morbidity in an urban district found that respiratory signs were the primary cause of hospitalization for both sexes [25].

This difference could be explained by the special orientation of each service, ours for digestive disorders and the emergency department for disorders of consciousness.

Diagnoses retained

Our study shows that the most common pathologies encountered in our elderly patients were infectious and tropical pathologies with 23.3% of cases: urogenital infection (n=14), malaria (n=12), extra-pulmonary and pulmonary tuberculosis (n=7), superinfected COPD (n=4); digestive pathologies with 21.8% of cases: gastric pathology (n=16) hepatopathy (n=15), esophageal pathology (n=6); cardiovascular pathologies with 15.6% of cases: vascular pathology (n=16), cardiac pathology (n=14); tumoral pathologies with 15.0% of cases: malignant tumor without metastasis (n=14), malignant tumor with metastasis (n=8). This result is comparable to several studies carried out in sub-Saharan Africa:

In 2009 in the internal medicine department, Fomba [6] noted that infectious diseases were in the majority with 26.78% of cases, without distinction of age category. The same was found by Zannou *et al*., in Benin [26] and Nzamba in Gabon [27] who respectively found 60.5% and 51.79% of infectious and parasitic pathologies of all ages, young and old adults.

In 2007 at the Referral Health Center of Bougouni, the main groups of diseases encountered were represented by infectious and parasitic diseases with 38.2%, including 5.5% in subjects aged at least 60 years [12].

In 2006 in Macina, Sympara [28] found that infectious and parasitic diseases came first with 45.45%, followed by diseases of the digestive system with 9.8%, followed by diseases of the circulatory system with 9.5%.

In 2002 at Point G, Ly found that out of 3,567 patients diagnosed, diseases of the circulatory system were the most frequent with 26.1%, followed by infectious and parasitic diseases with 17.7% and diseases of the respiratory system with 9.9%.

In 2002, Diarra also showed that the main groups encountered in surgical services were diseases of the genitourinary system with 44.9%, followed by diseases of the digestive system with 15.6% and then the tumoral pathologies with 8.5% [29, 30].

In 1983 in Cotonou, Benin, Hountondji [31] found that the main diseases were infectious and parasitic diseases with 27.4%, cardiovascular diseases with 18.55%, digestive diseases with 14.6%, respiratory diseases with 11.97% and those of the nervous system with 11.11%.

In 1974 in Abidjan, Côte d'Ivoire, in the internal medicine departments, Guehi [32] observed that cardiovascular pathologies ranked first with 21.28%, followed by hepatic pathologies with 16.4%, then infectious and parasitic diseases with 15.66% and then digestive diseases with 2.72%.

In 1972 in Dakar, Senegal, at the university hospital, in the internal medicine department, Sankale *et al*., [33] found that infectious and parasitic diseases came last with 16.34%, after hepatic diseases with 22.55%, digestive diseases with 21.57%, hematological diseases with 19.34% and cardiovascular diseases with 18.13%.

In 1973, still in Dakar, Senegal, Erneville [34] found the same groups of diseases, but digestive diseases came first.

On the other hand, our results are in contrast to those of some of his studies conducted outside sub-Saharan Africa:

In Tunisia, Abdallah Bchir *et al*., [25] had found in 1998 that diseases of the digestive and

respiratory systems were in the forefront with 28.1% of hospitalizations.

In France in 1998, in terms of prevalent morbidity, cardiovascular (19%) and ophthalmological (17%) diseases are in the lead from age 65, followed by diseases of the mouth and teeth (12%), osteoarticular (11%), metabolic and nutritional endocrine (9%), digestive system (8%) and genitourinary (3%), reported by Dramé [23].

In France, Leclerc *et al*., In France, Leclerc *et al*., [35] reported that cardiovascular diseases were in the forefront, followed by senility, symptoms and ill-defined morbid states, digestive and respiratory diseases, and tumors. On the other hand, according to the same French authors, infectious and parasitic diseases were rare, i.e. 1.2 to 1.5%. This is understandable, given the climatic conditions in our different countries.

This could be explained by the relatively high level of health of these populations and the place occupied by these hospitals, given that they are third level structures, and that infectious and parasitic diseases are primarily managed by the first and second level structures. And the predominance of infectious and parasitic diseases in our countries could be explained by the effect of the tropical climate which is favorable to the propagation of these diseases.

Assessment of the social environment (Social File)

In the evaluation of our social file, 72.5% of the elderly patients lived in couples, 25% living and maintaining a family within the society even after widowhood and only 2.5% living alone for lack of family after widowhood. According to Lafortune [16], cohabitation represented 56.6% against a solitary life of 43.7%. This state of affairs could be explained by the fact that our country does not have for the policy of house or institution of retirement, in cause nowadays, of enormous psycho-social problems (depression, dementia) in the West, even sometimes of mistreatment underlined in France [36].

Standardized geriatric assessment

Psycho-social assessment

It should be noted that in our series, this evaluation concerned consenting and conscious patients who sometimes knew the time from a watch with a hand when necessary. Thus, according to the Mini Mental Status (MMS) scale carried out in 69 elderly patients, 30.4% were suspected of having a cognitive deficit. This result is lower than that of Morliere [37], who found 70% cognitive deterioration in the persons admitted, but also than that of DRAME (45.4%) [23]. Following the same trend, for Bourdaud-Briand [18], 34.8% (i.e. 16 elderly patients) had an MMS score of between 20-24 points, and 30.4% (14 elderly hospitalized) had a score of less than 20/30 points. This would correspond to 65.2% of probable cognitive deficit against 34.8% of non-suspects. This could be explained on the one hand, by the fact that this deterioration seems to be by far the most important factor of institutionalization and on the other hand, with the impact of age on this condition by the very nature of the population composition, ours being younger and therefore less exposed.

According to the Mini Geriatric Depression Scale, 4.4% of elderly patients were at risk of depression. This rate is lower than that of Clement [38] where it can reach 45% in institutions and Morliere [37] found 66% of depressive state (moderate = 63%; severe = 3%) and Blanchard [39] in London found a predominance of anxiety-depressive disorders, i.e. 95%. According to the modified Gilleard scale, Dramé [23] found a 43.5% risk of depression.

This low rate could be explained by the conviviality of the social environment developed around our elderly and by the type of scale chosen, ours being simplified to 4 items.

According to the Mini-MNA scale performed on 46 elderly patients, 95.7% were at risk of poor nutritional status. The data are disparate in the literature but with worrying prevalences. Thus, according to the MNA, Morliere [37] found a 30% risk and a 40% risk of malnutrition in the 27 residents admitted and for Dramé [23] this risk was 61.1%. Nearly 33% of patients hospitalized in the geriatric ward and 5% at home were malnourished [40]. This demonstrates our precarious socio-economic living conditions in Mali. On the other hand, 66.7% of the patients were really identified as malnourished by Bourdaud-Briand [18].

Assessment of walking and balance or risk of falling

According to the timed Up and Go test, 42.6% (of the 47 cases submitted to the test) had a risk of falling; and 63% had this same risk but according to the unipodal station test (46 cases in total). Morliere [37] found a 15% risk according to the timed Up and Go test. This would be due to the existence of innovative policies creating a minimum living environment for better aging in the West than in Africa (Mali); but still implies, in any case, in view of these results, to clean up this living environment of elderly patients in order to minimize falls and their consequences.

In addtionnal, Dramé [23] found 81.1% of cases for the timed Up and Go test and 51.2% for the unipodal station test; this can be explained by the minimum age criterion for inclusion in the study. According to Gambassi *et al*., [41] in the USA, one patient out of three presented falls, that is 30%. For Sallantin [36], during a period of two years, 60% of the women and 45% of the men participating in his study had a fall.

Assessment of the degree of functional autonomy:

When 68.8% of the elderly patients lost their autonomy according to the ADL, 90% also lost it but according to the IADL in our series. With the series of Dramé [23] 60.1% had an ADL dependence at inclusion. With other scales, according to Morliere [37], 70% of the patients belong to iso-resource groups 1 and 2, i.e. fairly high levels of dependence.

According to INSEE in 2000, the number of dependent people over 60 years of age is estimated at one million two hundred thousand in France [36].

Finally, the interest of all these models is to allow the patient, with a concern for identifying his intrinsic or environmental risks, to benefit from the best preventive and therapeutic strategies available in order to live as long and as healthy as possible. For professionals, it is a matter of having an element that will serve as a decision-making tool in their current practices. Decision-makers will use it to plan resources and more efficient health policies.

Therapeutic aspects

This therapeutic aspect interested us because of the iatrogenic risk (neglected or unknown) occurring especially during the concomitant use of many drugs (poly-medication) because of the rather frequent poly-pathology; risk moreover reported by several authors in the elderly and sometimes at the origin of hospitalizations.

In our study, 60% of our elderly inpatients received 4 or more medications with extremes of 1 and 7. According to Morliere [37], the average number of drugs per resident at admission was 7.7 with extremes of 3 to 12 and he noted (for one prescription) between 0 and 9 risks of interactions with an average of 2 risks per patient. For Dramé [23], this average of drugs was 6±3. In the study by Bourdaud-Briand [18], on the hospital day 8, the elderly patients were taking between 2 and 13 drugs per day, i.e. an average of 6.2 drugs, and those using 4 to 6 drugs per day were the most frequent in 45% of cases.

Antibiotics and antituberculosis drugs clearly dominated this therapy in 82.5% of cases with amoxiclline clavulanic acid used as first line (36.7% of antibiotics). This is all the more logical since infectious and tropical pathologies were the nosological entity most frequently used in the diagnoses (23.3%) but also incriminated in the inflammatory etiology of the anemia (78%). This suggests a significant hygiene problem in elderly patients. Therefore, should systematic antibiotic therapy be given to all elderly hospitalized patients with anemia with or without an infectious context?

Antihypertensive drugs followed these antibiotics and antituberculosis drugs in second position for a frequency of 55% of cases, dominated by diuretics at 31.8% of antihypertensive drugs, including furosemide (18.2%) used as first-line treatment, sometimes in combination, knowing that it is not the only treatment for hypertension.

Blood transfusion was the most common treatment (80%), followed by iron supplementation to correct the hemoglobin level. This means that our elderly anemic patients most often present at the stage of decompensation leaving only the option of transfusion. The same observation was made by Tolo [10], transfusion was the most administered specific treatment of anemia with 27.4% of cases in elderly patients.

Evolutionary aspects

During the study, 50% of favorable evolution by complete or incomplete remission was recorded and 30% of deaths of the colligated were due to 3 diseases: pleuropulmonary (20.8%) with respiratory distress as the main cause, infectious (16.7%) and cardiovascular (12.5%) mostly incriminated. This rate of death and its causes varies according to the studies: Mengue - ME - Nguema [9] reported in his study 16% of deaths of which 29.4% due to acute pulmonary edema; according to INSEE data in 2005 in France from 65 years and over, tumor diseases (30%) and cardiovascular (nearly 29%) were the most important providers of death; Fofana [42] recorded 76% of living cases versus 24% of deaths in elderly diabetics; Fomba [6] reported 54.14% of favorable outcomes, including 60.9% for subjects over 60 years of age, and deplored 24% of deaths (including 31.3% for the same age group), with infectious and tropical diseases accounting for 33% of cases. The different methodological approach between these studies would explain this disparate situation in the literature.

CONCLUSION

Our study shows that elderly people, mostly males with an average age of 73.8 years, are frequently hospitalized in internal medicine. The reason for hospitalization is dominated by the digestive sign, the cutaneous monkey and the hematological sign. The most frequent pathologies encountered in our elderly patients were infectious and tropical pathologies dominated by urogenital infections, malaria, extra-pulmonary and pulmonary tuberculosis, superinfected COPD; digestive pathologies dominated by gastric pathologies, hepatopathy, oesophageal pathologies; cardiovascular pathologies by vascular pathologies; tumoral pathologies About two thirds of the elderly are polypathological and the majority of these elderly patients are polymedicated with the use of more than 4 drugs. These are mainly antibiotics and antituberculosis drugs, antihypertensive drug, antiplatelet aggregation and anticoagulant drug. The mortality rate is high, mostly due to pleuropulmonary, infectious and cardiovascular pathologies. The elderly, mostly living in couples, have a high risk of cognitive deficit, a low

risk of depression, a very high risk of poor nutritional status, a high risk of falling and a high proportion of loss of functional and instrumental autonomy.

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