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Complications of Corticosteroid Therapy in Rheumatological Practice in Guinea

Aly Badra Kamissoko[1*], Eve Urielle Amenan Ledjou[1], Mamadou Lamine Diallo[1], Abèni Faouzyath Yaya[1], Mohamed Mouhoudhoiri Yasser[1], Aboubacar Sidiki Condé[2], Souleymane Camara[1], Marie Traoré[1], Abdoulaye Barry[1], Moriba Touré[1], Kaba Condé[1], Owonayo Oniankitan[3]

[1]Department of Rheumatology, Ignace Deen University Hospital, Conakry, Guinea
[2]Department of Rheumatology, Cocody University Hospital, Abidjan, Côte d'Ivoire
[3]Department of Rheumatology, Sylvanus Olympio University Hospital, Lomé, Togo
Email: *drkamissoko@ymail.com

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Abstract

Introduction: Corticosteroid therapy used in rheumatology is effective but can lead to complications. The objective was to describe the complications of corticosteroid therapy in rheumatological practice at Ignace Deen University Hospital (Conakry). **Methods:** Cross-sectional study from July 1, 2022 to March 31, 2023. All patients who had been diagnosed with a rheumatological disease and who had received corticosteroid therapy were included. **Results:** Of the 1489 patients suffering from rheumatological diseases, 238 (15.9%) had received corticosteroid therapy. The average age of the patients was 48.5 ± 17.16 years with a female predominance (70.5%). The main indications for corticosteroid therapy were lower back pain due to probable disco-radicular impingement (35.8%) followed by rheumatoid arthritis (21.9%). The predominant method of administration was infiltration (56.9%). The average dosage was 24.2 ± 13.5 mg prednisone equivalent (range: 5 mg and 40 mg). Complications were present in 26 patients (10.9%) such as muscle cramps (3.8%), hypocalcemia (3.4%), edema of the lower limbs (3%), stimulation of appetite and weight gain (3%), high blood pressure (2.5%), hyperglycemia (2.5%). The occurrence of complications was associated with the high dose of corticosteroid ($p = 0.014$) and long-term use ($p = 0.000$). **Conclusion:** Corticosteroid therapy used in 15.9% of consultations in the rheumatology department of Ignace Deen University Hospital led to 10.9% of complications. These complications were related to the dose and duration of corticosteroid therapy.

Keywords

Corticosteroids, Complications, Guinea

1. Introduction

Corticosteroid therapy is a therapy frequently used in various clinical specialties [1]. In rheumatology, it is an integral part of the management strategy for numerous pathologies, due to its anti-inflammatory and immunosuppressive effects [2] [3] [4] [5] [6]. The effectiveness and rapid action of corticosteroids, particularly at high doses, allow the treatment of acute flare-ups and exacerbations of several rheumatological diseases [7]. However, corticosteroid therapy causes numerous complications: metabolic, cutaneous, bone and muscular, infectious, ocular, neuropsychiatric, and endocrine, which can compromise the functional and/or vital prognosis of patients and cause aesthetic damage [8]. Adverse effects, 66% of which were described as distressing, have been reported in France [1]. Metabolic (weight gain) and skin (facial erythrosis, stretch marks, acne) complications have been found in Morocco [9]. In West Africa, patients followed in rheumatology under corticosteroid therapy showed complications and adverse effects [10] [11]. In Guinea, corticosteroid therapy is used in the treatment of patients of all ages [12]. The objective was to describe the complications of corticosteroid therapy in rheumatological practice in Conakry (Guinea).

2. Patients and Methods

This was a cross-sectional study carried out from July 1, 2022 to March 31, 2023 in the rheumatology department of the Ignace Deen University Hospital in Conakry (Guinea). We included patients suffering from rheumatological conditions according to current criteria [13]-[22], treated with corticosteroid therapy during the study period. The study variables were quantitative and qualitative: age, body mass index, sex, daily corticosteroid dosage (low dose if <7.5 mg/day of prednisone equivalent, high dose if >7.5 mg/day of prednisone equivalent), method of administration of the drug (oral, intravenous, infiltration), duration of treatment (short if ≤2 weeks, prolonged if ≥3 months), nature of complications, adjuvant measures. Therapeutic education sessions were carried out for patients. Telephone calls were introduced to monitor compliance, collect complications and remind people of appointments. These appointments were anticipated in the event of a complication.

2.1. Data Analysis

The data was collected through the Kobo collect application and were analyzed in SPSS software. Qualitative variables were expressed by frequency and percentage. Quantitative variables were expressed as the mean with their standard deviations. Analytical tests were two-sided. We used the correlation test for quantitative variables, the Chi2 test for qualitative variables and the Fischer exact test for mixed variables in search of statistically significant links between the occurrence of complications and the different variables. The significance threshold was set at 5%.

2.2. Ethical Considerations

The protocol had been submitted and approved by a medical college at the Ignace Deen University Hospital in Conakry. The information has been collected and processed confidentially with strict compliance with ethics.

3. Results

Of the 1489 patients received, 238 (15.9%) were on corticosteroid therapy. The average age of the patients was 48.5 ± 17.1 years (range 10 and 93 years) with a female predominance (70.5%) (Table 1).

Corticosteroid therapy was mainly used in patients suffering from lower back pain due to probable disco-radicular conflict (36.1%), followed by rheumatoid arthritis (21.8%), chronic undifferentiated inflammatory rheumatism (17.6%) and knee osteoarthritis in thrust (14.7%) (Table 2). Prednisone was the most prescribed corticosteroid (50.8%), followed by betamethasone (48.3%). The average dosage was 7.16 ± 13.5 mg prednisone equivalent (Extremes: 5 mg and 40 mg) with a short-term prescription frequency (81.5%). For rheumatoid arthritis and undifferentiated chronic inflammatory rheumatism, the dosage ranged from 5 mg to 15 mg prednisone equivalent daily for a duration covering the study period. For gout, the dosage was 20 to 30 mg for 5 days. In both cases, injections were performed in the event of persistent arthritis while inflammation was reduced to other joints. For degenerative rheumatism, corticosteroid therapy was used by infiltrating predisolone at a dose of 75 mg (herniated disc, lumbar canal stenosis), betamethasone (peripheral osteoarthritis), triamcinolone 40 mg (congestive knee osteoarthritis). Complications were found in 26 patients (10.9%). They presented muscle cramps (3.8%), hypocalcemia (3.4%), lower limb edema (3%), appetite stimulation (3%), and weight gain (3%). %), high blood pressure (2.5%), and hyperglycemia (2.5%) (Table 3). The occurrence of complications of corticosteroid therapy was significantly associated with the high dose of corticosteroid ($p = 0.014$) and prolonged use of corticosteroid ($p = 0.000$). There were more complications by oral administration, but there was no link between the type of corticosteroid and the occurrence of complications (Table 4).

Table 1. Demographic characteristics of corticosteroid therapy taken by patients in the Rheumatology Department of Ignace Deen University Hospital.

	Workforce	Percentage (%)
Sex		
Feminine	168	70.5
Masculine	70	29.6
Age (years)		
10 - 30	48	20.4
31 - 50	79	33.7

Continued

51 - 70	88	37.4
71 - 90	22	8.1
≥91	1	0.4
Total	**238**	**100**

Average age: 48.5 ± 17.1 years; Extremes: 10 years and 93 years.

Table 2. Rheumatic diseases, indications for corticosteroid therapy in the Rheumatology Department of Ignace Deen University Hospital.

	Workforce	Percentage (%)
Chronic inflammatory rheumatism		
Rheumatoid arthritis	52	21.8
Undifferentiated chronic inflammatory rheumatism	42	17.6
Gougerot-Sjögren syndrome	7	2.9
Ankylosing spondyloarthritis	5	2.1
Juvenile idiopathic arthritis	5	2.1
Systemic lupus erythematosus	3	1.3
Degenerative pathologies		
Common lumboradicular pain due to probable disco-radicular conflict	86	36.1
Gonarthrosis in attack	35	14.7
Common cervico-brachial neuralgia	11	4.6
Osteoarthritis in flare	6	2.5
Tendinopathy	8	3.4
Gout	2	0.8
Total	**238**	**100**

Table 3. Therapeutic characteristics of corticosteroid therapy in patients in the Rheumatology Department of Ignace Deen University Hospital.

	Workforce	Percentage
Type of corticosteroids used		
Prednisone	121	50.8
Methylprednisolone	115	48.3
Triamcinolone	17	7.1
Betamethasone	4	1.7
Dexamethasone	1	0.4

Continued

Administration mode		
Infiltration (local)	136	57.1
Oral (systemic)	121	50.8
Intravenous (systemic)	3	1.3
Dosage (prednisone equivalent/day)		
10 mg	72	30.3
20 mg	21	8.8
40 mg	11	4.6
5mg	10	4.2
15 mg	7	2.9
Duration of treatment		
Short	194	81.5
Extended	44	18.5
Occurrence of complication		
Yes	26	10.9
No	212	89.1
Complications after infiltration		
Pruritus	3	1.3
Skin discoloration	1	0.4
Post lumbar puncture syndrome	1	0.4
Complications after general administration		
Muscle cramps	9	3.8
Hypocalcemia	8	3.4
Lower limb edema	7	2.9
Appetite stimulation and weight gain	7	2.9
High blood pressure	6	2.5
Hyperglycemia	6	2.5
Gastritis	3	1.3
Hypokalemia	2	0.8
Corticosteroid-induced diabetes	2	0.8
Peptic ulcer	1	0.4
Cushingoid facies	1	0.4

Table 4. Correlations between the occurrence of complications and age, sex, duration, method of administration, dose and type of corticosteroid used.

	Complications		p-value
	Yes N = 26 (%)	No N = 212 (%)	
Age			
<60	14 (53.8)	114 (53.8)	0.86
≥60	12 (46.1)	98 (46.2)	
Sex			
Feminine	16 (61.5)	152 (71.7)	0.22
Masculine	10 (38.5)	60 (28.3)	
Duration			
Short	5 (19.2)	189 (89.2)	**0.00**
Extended	21 (80.8)	23 (10.8)	
Administration mode			
Orale	20 (77)	101 (47.6)	
Intravenous	1 (3.8)	2 (0.94)	0.41
Infiltration	2 (19.2)	131 (61.8)	
Dosage			
Low	7 (26.9)	187 (88.2)	**0.01**
High	19 (73.1)	25 (11.8)	
Corticosteroids used			
Prednisone	14 (53.8)	107 (50.5)	
Betamethasone	13 (50%)	102 (48.1)	
Triamcinolone	0 (0%)	17 (8)	0.57
Methylprednisolone	0 (0%)	1 (0.5)	
Dexamethasone	2 (7.7%)	2 (1)	

4. Discussion

We carried out a cross-sectional study to describe the complications of corticosteroid therapy in the rheumatology department of the Ignace Deen University Hospital in Conakry.

Which is the only reference department for rheumatic pathologies in the country. Failure to keep medical appointments with patients represented the main limitation. Despite this limitation, this first study on corticosteroid therapy made it possible to evaluate its complications. Due to the non-compliance with

appointments, the collection of complications that occurred was limited by means of telephone calls. So the collection was subjective for these few patients. Among the 1489 patients seen in consultation at the rheumatology department during the study period, 238 had received corticosteroid therapy, representing a prevalence of 15.9%. This high prevalence corroborated the data of Zomalheto *et al.* [10] (17.1%). This similarity could be explained by the frequency of chronic inflammatory conditions which are treated with corticosteroid therapy [23]. As well as spinal pathologies whose treatment required infiltrations? The predominant indications for corticosteroid therapy in this study differed from the Beninese data [10], Nassar *et al.* [9] who respectively found a predominance of rheumatoid arthritis and lupus erythematosus. Systemic lupus erythematosus is rarely reported in Guinea [24]. As for lumboradicular pain caused by probable disco-radicular impingement (CDR), it occupies second place among spinal pathologies [24]. Infiltrations for lower back pain were performed using methylprednisolone, which would explain their frequency as in West African studies [10] [11]. The predominance of these two molecules could be justified by their clinical effectiveness as well as their accessible cost in Guinea. The most represented method of administration differed from that of Nassar *et al.* [9] in Morocco and Fardet *et al.* [1] in France which had found 100% oral use. In our series, lumboradicular pain due to probable disco-radicular conflict required infiltrations. The doses ranging from 5 mg/day to 40 mg/day of prednisone equivalent were explained on the one hand by the frequency of rheumatoid arthritis having a background treatment accompanied by a low dose of corticosteroid; on the other hand, lower back pain required high doses over a short period of time. This differed from the data of other authors reporting long-term corticosteroid therapy [1] [10] [11]. The low rate of complications observed in our series compared to data found in the region [10] [11]. could be linked to the relatively short duration of corticosteroid therapy in the majority of patients, to the low doses administered, and to the most commonly used mode of administration: infiltration. According to Damiano [25], the complications observed result from non-compliance with health and diet measures and the duration of corticosteroid use by the patients concerned. These results were consistent with published literature data [9] [26]. In these studies, weight gain was present in more than 2/3 of the cases followed by skin complications in more than one in 4 cases. Blood pressure imbalance, diabetes, and neuropsychiatric complications were side effects encountered in their series but to a lesser degree. The low frequency of osteoporosis could be linked to the unavailability of bone densitometry in our context. Indeed, the work of Bouvard *et al.* [27] in 2011, revealed that osteoporosis was present and asymptomatic in half of the patients exposed to systemic corticosteroid therapy, especially long-term. Complications after infiltration such as pruritus and skin discoloration have been described [10] and could sometimes be due to preservatives (sulfites) present in injectable preparations. Post-lumbar puncture syndrome was reported in 10% to 30% of patients ac-

cording to Valat and Rozenberg [28] while only one case was found in our series. This could be due to the fact that the spinal infiltrations were not carried out closely. The occurrence of complications linked to long-term corticosteroid therapy corroborated with the data of Fardet *et al.* [1]. This could be explained by the fact that taken for a long time, corticosteroids cause depression of the hypothalamic-pituitary axis, a modification of the metabolism of nutrients, electrolytes and vitamins [29].

The high dose of corticosteroid therapy at the origin of the complications was also found by Nassar *et al.* [9] and would be justified by the prolonged bioavailability of corticosteroids when taken in high doses, which would prolong their actions in the different mechanisms of occurrence of complications.

5. Conclusion

Corticosteroid therapy used in 15.9% of consultations in the Rheumatology Department of Ignace Deen University Hospital led to 10.9% of complications. These complications were related to the dose and duration of corticosteroid therapy. These results call for the implementation of corticosteroid treatment at the minimum sufficient dose for the shortest possible duration. A study on knowledge, attitudes and practices of corticosteroid therapy would be important. It will also be necessary to communicate the results and strengthen therapeutic education sessions for patients.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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