P.1.4

Auteurs : **Dégboé B**, Atadokpèdé F, Saka B, Adégbidi H, Koudoukpo C, Yédomon H, do Ango Padonou F.

Titre: Vitiligo on black skin: epidemiological and clinical aspects in dermatology, Cotonou (Benin).
Référence : International Journal of Dermatology 2017; 56 (1): 92-96. **Facteur d'impact 2016-2017: 1,56**.

URL de l'article/ DOI: doi: 10.1111/ijd.13366

Type de revue: revue indexée dans:Abstracts in Anthropology (Sage) Abstracts on Hygiene & Communicable Diseases (CABI) Academic Search (EBSCO Publishing) Academic Search Alumni Edition (EBSCO Publishing) Academic Search Elite (EBSCO Publishing) Academic Search Premier (EBSCO Publishing) Agroforestry Abstracts (CABI) Botanical Pesticides (CABI) CAB Abstracts® (CABI) CABDirect (CABI) Crop Physiology Abstracts (CABI) Current Contents:Clinical Medicine (Clarivate Analytics) Embase (Elsevier) Forest Products Abstracts (CABI) Forestry Abstracts (CABI) Global Health (CABI) Health Source Nursing/Academic (EBSCO Publishing) HEED: Health Economic Evaluations Database (Wiley-Blackwell) Helminthological Abstracts (CABI) Horticultural Science Abstracts (CABI) Index Veterinarius (CABI) InfoTrac (GALE Cengage) Journal Citation Reports/Science Edition (Clarivate Analytics) Leisure Tourism Database (CABI) Leisure, Recreation & Tourism Abstracts (CABI) MEDLINE/PubMed (NLM)
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ISSN de la revue : 1365-4632
Site web de la revue : onlinelibrary.wiley.com

International journal of dermatology

Author(s): International Society of Tropical Dermatology
NLM Title Abbreviation: Int J Dermatol
Title(s): International journal of dermatology.
Other Title(s): INT J DERMATOL
Int J Dermat
Int. J. Derm.
Continues: Dermatologia internationalis ISSN 0096-1108
Publication Start Year: 1970
Frequency: Twelve no. a year
Country of Publication: England
Publisher: Philadelphia, Lippincott.
Latest Publisher: Oxford : Blackwell Science
Description: v. illus.
Language: English
ISSN: 0011-9059 (Print)
1365-4632 (Electronic)
0011-9059 (Linking)
Coden: IJDEBB
LCCN: 70613461
cn 97390018
Electronic Links: http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1365-4632
In: MEDLINE: v9n1,Jan./Mar. 1970-
Index medicus
PubMed: v9n1,Jan./Mar. 1970-
Current Indexing Status: Currently indexed for MEDLINE.
Current Subset: Index Medicus
MeSH: Dermatology*
Broad Subject Term(s): Dermatology
Publication Type(s): Periodical
Notes: Also issued online.
Text in English with summaries in English, French, and Spanish.
Official organ of the International Society of Tropical Dermatology.
Other ID: (DNLM)I26740000(s)

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International journal of dermatology

Author(s): International Society of Tropical Dermatology
NLM Title Abbreviation: Int J Dermatol
Title(s): International journal of dermatology.
Other Title(s): INT J DERMATOL
Int J Dermat
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Continues: Dermatologia internationalis ISSN 0096-1108
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Coden: IJDEBB
LCCN: 70613461
cn 97390018
Electronic Links: http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1365-4632
In: MEDLINE: v9n1,Jan./Mar. 1970-
Index medicus
PubMed: v9n1,Jan./Mar. 1970-
Current Indexing Status: Currently indexed for MEDLINE.
Current Subset: Index Medicus
MeSH: Dermatology*
Broad Subject Term(s): Dermatology
Publication Type(s): Periodical
Notes: Also issued online.
Text in English with summaries in English, French, and Spanish.
Official organ of the International Society of Tropical Dermatology.
Other ID: (DNLM)I26740000(s)
(OCoLC)01753567
NLM ID: 0243704 [Serial]

International Journal of Dermatology

January 2017

Volume 56, Issue 1

Pages 1–120, e1–e15

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   Issue Information - TOC (pages 1–2) (/doi/10.1111/ijd.13465/full)

   Version of Record online: 12 DEC 2016 | DOI: 10.1111/ijd.13465

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   - Article (/doi/10.1111/ijd.13465/full)
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   Version of Record online: 9 SEP 2016 | DOI: 10.1111/ijd.13358

   - Abstract (/doi/10.1111/ijd.13358/abstract)
   - Article (/doi/10.1111/ijd.13358/full)
   - PDF(1181K) (/doi/10.1111/ijd.13358/epdf)
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(/doi/10.1111/ijd.13408/full)

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Version of Record online: 25 OCT 2016 | DOI: 10.1111/ijd.13408

- Abstract (/doi/10.1111/ijd.13408/abstract)
- Article (/doi/10.1111/ijd.13408/full)
- PDF(159K) (/doi/10.1111/ijd.13408/epdf)
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   Version of Record online: 25 OCT 2016 | DOI: 10.1111/ijd.13403

   - Abstract (/doi/10.1111/ijd.13403/abstract)
   - Article (/doi/10.1111/ijd.13403/full)
   - PDF(107K) (/doi/10.1111/ijd.13403/epdf)
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   Version of Record online: 28 SEP 2016 | DOI: 10.1111/ijd.13366

   - Abstract (/doi/10.1111/ijd.13366/abstract)
   - Article (/doi/10.1111/ijd.13366/full)
   - PDF(145K) (/doi/10.1111/ijd.13366/epdf)
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   Version of Record online: 7 APR 2016 | DOI: 10.1111/ijd.13299

   - Abstract (/doi/10.1111/ijd.13299/abstract)
   - Article (/doi/10.1111/ijd.13299/full)
   - PDF(437K) (/doi/10.1111/ijd.13299/epdf)
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International Journal of Dermatology

Tropical medicine rounds

Vitiligo on black skin: epidemiological and clinical aspects in dermatology, Cotonou (Benin)

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Conflicts of interest: None.

doi: 10.1111/ijd.13366

Abstract

Background Vitiligo is unsightly on darkly pigmented skin and leads important stigmatization because of the mix-up with leprosy.

Patients and methods We analyzed retrospectively the epidemiological and clinical patterns of vitiligo on darkly pigmented skin between 1988 and 2008 in the Department of Dermatology in Cotonou (Benin). The diagnosis was made based on the clinical characteristics of vitiligo.

Results Two hundred and forty-six patients were seen, representing 0.9% of new consultations. The gender ratio was 1 : 1, and the mean age of patients was 25.9 years. The mean duration of the lesions was 30.9 months. Among the 246 patients, an associated pathology was found in 26% of cases. These included atopy (23.2%), diabetes (1.6%), thyroid disease (0.8%), and alopecia (0.4%). A family history of vitiligo was present in 1.2% of cases. The sites of the lesions were in descending order of frequency: head (60.6%), lower limbs (40.2%), upper limbs (33.3%), trunk (22.4%), genitals (13.0%), and neck (8.9%). On the head, the most common sites affected were the lips (65.1%), cheek (20.8%), and ears (16.8%). According to the different clinical forms, vitiligo was achromic (76%), speckled (12.6%), and trichromic (11.4%). Vitiligo vulgaris was the commonest form of the disease (52.4%), followed by localized vitiligo (36.2%), segmental vitiligo (9.8%), and vitiligo universalis (1.6%). Triggering factors were identified in 4.5% of patients.

Conclusion Our survey shows that the patterns of vitiligo are similar to that reported from other African countries with a few distinguishing particularities.

Background

Vitiligo is a depigmenting condition characterized by progressive and circumscribed hypomelanosis of the skin and hair, with total absence of melanocytes microscopically. It is the most prevalent pigmentary disorder, occurs worldwide, with an incidence rate between 0.1 and 5%, irrespective of gender, age, race, ethnic origin, and skin color.[1,2]

Although asymptomatic and non-disabling, vitiligo is a very debilitating disease because of its exhibited and highly unpleasant character on dark skin. In addition, although the diagnosis of vitiligo is easy, it can be confused with leprosy in an endemic zone of this disease, leading to further stigmatization.

The lack of standardized treatment ends in failure sometimes because of the absence of sufficient data on pathogenic mechanisms. Nowadays, different theories regarding its pathogenesis have been put forward. It includes genetic factors, autoimmune process, neuronal, biochemical, and oxidative stress factors. The autoimmune hypothesis suggests an autoimmune attack against melanocytes. The neuronal hypothesis proposes that an increased release of melanocytotoxin from the autonomic nerve endings in the microenvironment of melanocytes injures these cells. The biochemical hypothesis is based on the formation of hydrogen peroxide, which is induced by an increase in catecholamine and is toxic for melanocytes. The oxidative stress theory suggests that abnormal permeability of the melanosome membrane, which normally prevents the diffusion of toxic melanin precursors into the cytoplasm, may cause melanocyte damage.[2–5]

Infectious agents, Koebner's phenomenon (KP), and psychological (stress and personality characteristics of patients) and environmental factors should contribute to develop the disease.[2–4] KP or the "isomorphic response of Koebner" is defined as the appearance of new lesions of a dermatosis over the sites

of mechanical trauma. It has been reported in association with vitiligo, and its incidence varies from 21 to 64%.[6]

Concerning patients with a darkly pigmented skin, very few studies have been done on vitiligo.[3,7–10] The purpose of this study was to research the epidemiological and clinical characteristics of vitiligo on black skin in the Department of Dermatology at the national and university teaching hospital of Cotonou.

Patients and method

The study was descriptive and retrospective. It took place from June 1988 to May 2008 in the Department of Dermatology at the national and university teaching hospital "Hubert Koutoukou Maga" (Cotonou, Benin). It is the largest referral center of dermatology in Cotonou, the economic capital of Benin. We listed all new cases of vitiligo on black skin recorded in the consultation registers. The diagnosis of vitiligo was essentially clinical and established on its clinical findings. Classically, vitiligo appears as an achromic spot with variable size and shape, without scale. The border is usually convex and can have the same color as the normal skin or be hyperpigmented. Thus, all the recorded cases could be mistaken for Hansen's disease, vitiligoid lupus, pityriasis alba, or post-inflammatory hypopigmentation were excluded. To rule out some confusing conditions, we used supplementary criteria. The absence of neurological manifestations excluded Hansen's disease. Vitiligoid lupus was excluded when there was no hematological abnormality and when immunology tests were not compatibles or histopathology not consistent. Pityriasis alba is a scaling condition seen most often with children and is characterized by its temporary appearance. The hypopigmentation following cutaneous trauma or inflammation is a common physiological phenomenon. Clinical aspects, inspection under Wood's light (hypomelanotic skin and not amelanotic skin as in vitiligo), and re-evaluation on the long term can help to differentiate in doubtful situations. In addition, data were incomplete in 12 records, which were excluded.

Data collected:

- Dependent variable: vitiligo.
- Independent variables: socio-demographic (age, gender), and clinical characteristics, etiology, and pathogenesis (mode of onset; duration of lesions; triggering factor; KP; initial topography; clinical appearance depending on the expanse and the intensity of achromia; personal and family histories such as atopy; diabetes; autoimmune thyroid disorders; pernicious anemia; alopecia areata; family history of vitiligo; etc.; and associated symptoms).

These data collected, using a questionnaire, were analyzed by the sixth version of the Epi Info software.

Results

Of 28 339 new patients seen during the period, 246 cases of vitiligo were included giving 0.9% of the prevalence. The gender ratio was 1 : 1, i.e., 131 (53.3%) men and 115 (46.7%) women. Average age was 25.9 years old. The age range of 15–24 years was most affected (29.3%), and 82.9% of patients was under 40 years old.

The mean duration of lesions was 30.9 months and ranged from 1 month to 40 years. Personal histories were atopy (23.2%), diabetes mellitus (1.6%), thyroid dysfunction (0.8%), and alopecia areata (0.4%). Family history of vitiligo was found in 1.2%. The vitiligo was accompanied by pruritus in 33 patients (13.4%) and burning sensation in one patient (0.4%).

The topographic distribution of lesions on the body is summarized in Table 1. The sun-exposed areas including the head and neck were more affected (69.5%) followed by the lower limbs (40.2%) and the upper limbs (33.3%). Genital vitiligo was noted in 32 patients (13%). The most affected anatomic regions of the head were lips (65.1%) (Fig. 1), cheek (20.8%), ears (16.8%), and least affected were the palpebral region (3.4%) and the eyebrow (2%).

Depending on the intensity of achromia, we had the following different clinical forms: achromic vitiligo (76%), speckled vitiligo (12.6%), and trichromic vitiligo (11.4%).

Concerning the different aspects observed by the extent of damage (Table 2), vitiligo vulgaris was the commonest form of

Table 1 Distribution by the site of the 246 cases of vitiligo seen in the Department of Dermatology at the national and university teaching hospital "Hubert Koutoukou Maga" (Cotonou, Benin) from 1988 to 2008

Sites	*n*	Frequency (%)[a]
Head	149	60.6
Lower limbs	99	40.2
Upper limbs	82	33.3
Trunk	55	22.4
Genital organs	32	13.0
Neck	22	8.9

[a]The frequency of the site is the number of sites in relation to the total number of the 246 cases.

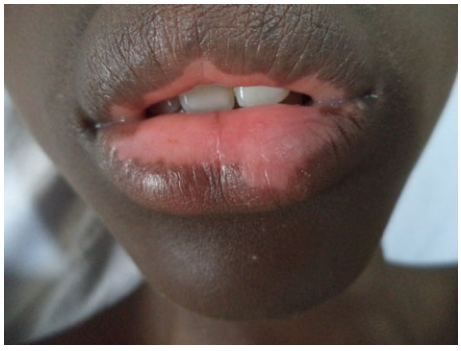

Figure 1 Achromic vitiligo on lips

Table 2 Clinical forms according to the extent of vitiligo in the 246 patients seen in the Department of Dermatology at the national and university teaching hospital "Hubert Koutoukou Maga" (Cotonou, Benin) from 1988 to 2008

Clinical forms	*n*	Frequency (%)
Vitiligo vulgaris	**129**	**52.4**
Localized vitiligo	**89**	**36.2**
Segmental vitiligo	24	9.8
Vitiligo universalis	4	1.6
Total	246	100.0

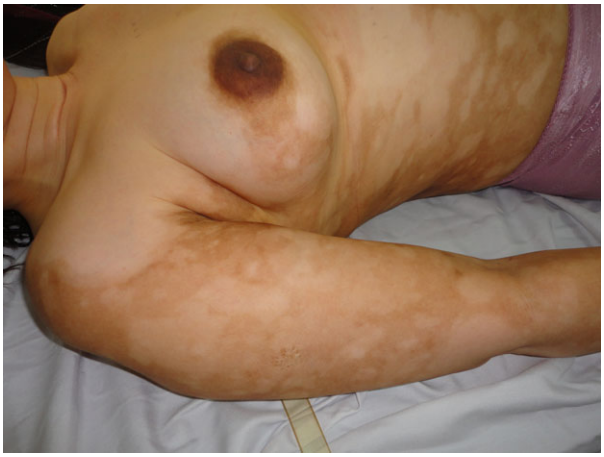

Figure 2 Vitiligo universalis associated autoimmune thyroiditis in a young woman

the disease (52.4%), followed by localized vitiligo (36.2%), segmental vitiligo (9.8%), and vitiligo universalis (1.6%) (Fig. 2).

Triggering factors were identified among 11 patients: trauma (five cases), inflammation (four cases), cotrimoxazole (one case), and chemical (one case).

Discussion

The limit of our study is related to its retrospective character, which did not allow us to collect all data accurately.

If the cosmopolitan character of the vitiligo is unanimously recognized by all the authors, its prevalence is very variable within the same race and between the various races. The hospital prevalence of vitiligo in Cotonou was 0.9%. In West Africa, this prevalence is very variable: 0.5% in Togo,[9] 1.2% in Senegal,[3] and 2.8% in Nigeria.[8]

The gender ratio was 1 : 1. We observed a male predominance contrary to the usual data.[3,8,9]

In our series, the mean age of patients was 25.9 years. The age range of 15–24 years was most affected (29.3%), and 82.9% of patients were under 40 years old. Vitiligo was common in the younger group in our study. This distribution is consistent with the usual data that locates the onset age of vitiligo between 10 and 30 years.[1–4,7–10] Depression, sleep disturbances, suicidal thoughts, suicidal attempts, difficulties in relationships, and avoidance of social situations have been reported in those young individuals afflicted by vitiligo before adulthood.[4,11]

In our study, vitiligo was a chronic disease because it appeared 2½ years on average before the first consultation. We speculate that this long duration of the disease is often due to the lateness of consultation in dermatology by the patients. In Benin, vitiligo (commonly known as leukoderma) is associated with some religious beliefs such as to be under a spell (black magic). Therefore, we think that people with vitiligo consult a charlatan before they consult physicians. Vitiligo is often confused with leprosy, and the patients often consult leprosy's centers, leading to a late consultation in dermatology.

The associated symptoms in our study were pruritus and burning sensation. Vitiligo is characterized by a loss of functional melanocytes or by a decrease of melanin in the epidermis.[3] Because of this deficiency, we suppose that the patients who had this disease often have photosensitivity that can be expressed by a burning sensation or pruritus on areas of vitiligo.

In most publications, selective involvement of the upper and lower limbs, head, and trunk is observed. On the head, vitiligo particularly affects the lips.[7,8,12,13] In our series, the cephalic region was most affected. In this localization, the lips were by far the most affected site (65.1%) followed by the cheek (20.8%) and ears (16.8%). Vitiligo selectively affects sun-exposed areas on darkly pigmented skin. The commonest localization on the lips can be explained that this is an area both sun-exposed and poorly pigmented. According to some authors, the sun would act in a KP manner.[3] Furthermore, diets such as those with an excessive intake to spice (hot pepper, black pepper, ginger) by Africans could increase irritation of the lips.

Clinically, achromic vitiligo was the most frequent form (76%). Speckled vitiligo was observed in 12.6% of cases in our study. Speckled vitiligo may be mistaken, in the absence of histopathology for a pigmentary disorder observed in scleroderma and dermatomyositis on black skin. In the series of Ortonne *et al.*[14] composed mainly of Caucasians, speckled vitiligo was observed in 6% of cases. Although trichromic vitiligo is common in black people and was seen in 11.4% in our study, Gauthier and Benzekri have reported that KP lesions may present as trichromic vitiligo.[15]

The pathogeny of vitiligo is complex and has not been fully elucidated. The neuronal hypothesis states that altered reactions of melanocytes to neuropeptides and catecholamines are responsible for melanocyte destruction. In the self-destruct hypothesis based on an oxidative stress theory, melanocytes self-destruct due to defects in protective mechanisms responsible for removing toxic melanin precursors. The biochemical hypothesis postulates an overproduction of a tyrosine

hydroxylase cofactor, hydrobiopterin, resulting in increased catecholamine synthesis.[4,5]

The existence of vitiligo in another family member and even in a homozygous twin highlights the genetic predisposition of this disease.[3,7,13,16] A family history of vitiligo is also reported in our study. Indeed, a mutation in the gene *NAPL1* (Nacht leucinerich-repeat protein 1) has been identified as correlating with the risk of developing vitiligo.[3]

The autoimmune hypothesis is supported by the observation that several autoimmune diseases often appear along with vitiligo. The most frequently reported autoimmune diseases are autoimmune thyroid disorders, diabetes, pernicious anemia, and alopecia areata.[4,17–20] In our series, we noted a small proportion of these pathologies. Amerio *et al.*[20] and Alkhateeb *et al.*[21] have recently shown that these diseases are most commonly seen in cases of segmental vitiligo and vitiligo universalis. Moreover, patients with vitiligo often display elevated levels of serum antibodies to melanocytic antigens (tyrosinase and tyrosinase-related proteins 1 and 2).[4,5]

Atopy was found in about a quarter of our patients, against only 2.1% in the series of Handa and Kaur[12] and 4% in the case of Niang *et al.*[3] We speculate that atopy can be considered as a triggering factor in the development of the vitiligo.

Koebner's phenomenon in vitiligo has been redefined and classified recently as type 1, 2A, or 2B based on history and examination. In vitiligo, it carries special significance as it is often used as a marker of disease activity and stability. The skin injury inducing KP in vitiligo may be of any kind: physical (wounds, cuts, and scratching), mechanical (friction), chemical/thermal (burns and sunburns), allergic (contact dermatitis) or irritant reactions (vaccination and tattoos), chronic pressure, inflammatory dermatoses (eczema, psoriasis), or therapeutics (radiotherapy, phototherapy, and topical immunotherapy with diphenylcyclopropenone in patients with alopecia areata).[22,23]

Koebner's phenomenon was frequently present in repeated pressure or friction (elbows and knees) and/or areas of chronic friction that may occur during washing, dressing, personal care, sports and occupational activity, or continuous pressure from clothing or other items. However, it can also be observed at other anatomic sites. The typical sites of involvement seem to be related to the possibility of external injury to the skin. These "hidden" koebnerization factors could result in the chronicity of vitiligo. This is in accordance with the theory that generalized vitiligo is triggered by a complex interplay of stressors, including mechanical trauma. Therefore, we must take them into account in the treatment of the vitiligo.[23]

The KP induced by trauma and inflammation have been reported by some authors in the occurrence of vitiligo.[7,8,13,20] These factors were noted in our study for 4.5% of patients. We believe with Niang *et al.* that some daily gestures such as friction with the bath glove in African people can act as KP.[3] Blackie Obe emphasized that genital organs are frequently affected among black people because he blames physical trauma such as excision, circumcision, and other traditional practices.[10] Despite the relevance of KP, its pathogenesis and clinical significance generally, and in vitiligo in particular, it remains an enigma.[22,23]

Psychological stress increases levels of neuroendocrine hormones that affect the immune system and alter the level of neuropeptides. The increase in the level of neuropeptides may be the initiating event in pathogenesis of vitiligo. A vicious circle becomes established because psychological factors can appear before and after the development of the vitiligo.[11]

The situations such as economic difficulties, mourning, difficult pregnancy, and change of residence are identified before apparition of the disease by few authors.[3] Vitiligo is thus an important skin disease having major impact on the quality of life of patients. Appearance of the skin can condition an individual self-image, and any pathological alteration can have psychological consequences. Many patients will feel distressed and stigmatized by their condition. Particularly in teenagers, mood disturbances including irritability and depression are common. Patients with vitiligo are very sensitive to the way others perceive them, and they will often withdraw, because they anticipate being rejected. Sometimes, strangers and even close friends can make extremely hurtful and humiliating comments. The impact of such factors is profound, subjecting them to emotional distress, interference with their employment, or they use tension-lessoning, oblivion-producing substances such as alcohol. Severe depression has been known to lead to suicide attempts.[11] Therefore, in the treatment of vitiligo, counseling is important because it can help to improve quality of life of patients and to obtain a better treatment response.

Conclusion

The prevalence of vitiligo in the Department of Dermatology at the national and university teaching hospital "Hubert Koutoukou Maga" (Cotonou, Benin) was 0.9%. Young patients were the most frequently affected. Vitiligo affected with predilection sun-exposed areas, particularly the lips. Speckled vitiligo and trichromic vitiligo seemed specific on darkly pigmented skin. Besides the usual etiologic and pathogenic factors, KP was frequently reported on dark skin. The displaying character of vitiligo on dark skin has a profound effect on the quality of life of patients. The development of better treatment protocols is necessary.

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