

Male Anogenital Region Lesions: Prospective Analysis of 150 Patients

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ABSTRACT: Male anogenital region lesions (MARL) of skin and soft tissue represent a variety of problems, from infectious lesions to tumoral diseases. The aim of this study is to evaluate the incidence, location and clinical features of MARL in our population. One hundred and fifty male patients who were admitted to our dermatology clinic with anogenital region lesions were included in this prospective study. The anogenital region is divided into six parts: penis, pubis, scrotum, inguinal region, perianal region, and gluteal region. Demographic features of the patients, diagnosis, and location of lesions were analysed.

Ages of patients ranged from 18 to 72 (40.49 ± 14.5). The most common lesions were infectious diseases (59.3%), inflammatory lesions (29.3%) and tumoral lesions (16.0%). The most common locations of lesions were 36.6% on the penis, 29.3% in the inguinal region, and 19.3% on the pubis. All of the patients in this study were circumcised, and all regularly shave their genital hair. This in our opinion is the reason we did not see any cases of balanitis or balanopostitis, or more cases of HPV, molluscum and folliculitis in the pubic region. Improving knowledge of incidence, location and treatment modalities of MARL and cooperation with related clinics will help patients to get the right diagnosis and treatment as quickly as possible.

KEYWORDS: anogenital region, male, skin lesion

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Introduction

A wide range of lesions can affect the skin and soft tissue of the male anogenital region, including infectious, inflammatory, neoplastic, ulcerating and pigmented lesions. Most common skin diseases can affect the anogenital region as well as the other parts of the body; but some are particular to the anogenital region.¹ As a rule, the anogenital region is a closed region, which makes it a warm and humid place. Mechanical irritation caused by personal hygiene and clothing and chemical irritation caused by urine, soap and detergents are common for this area. Also, personal hygiene varies from patient to patient, and may be inadequate or overexpressed.² All these causes may lead to infectious and sometimes to inflammatory diseases.

Diseases of the anogenital region can intimidate the patient, and because of the private nature of this body region, many patients hesitate to see a doctor. This compromises the doctor's ability to diagnose, follow up and treat the condition within a healthy timeframe.^{3–5} The anogenital region is sometimes neglected during routine dermatologic examination and some patients may allow only partial visualisation of the region. But even with no clinical complaint, noting a genital ulcer scar is important in diagnosis of Behcet's disease. Without genital examination, this might not be possible. For this reason, a full examination of the genital region is important in both systemic diseases with genital manifestations and locally specific skin and soft tissue diseases.



The current medical literature lacks clinical studies that analyze all MARL systematically. In this study, the incidence, location and clinical features of MARL and distributions regarding the patients' ages were evaluated and a brief review of the literature was carried out.

Subjects and Methods

Skin and soft tissue lesions of the anogenital region in 150 male patients who were admitted to our dermatology clinic were analyzed. Approval from the Ankara Atatürk Training and Research Hospital ethics committee was obtained and the study was done in accordance with Helsinki guidelines. All patients participating the study signed informed consent forms. Demographic data, comorbid situations, BMIs and educational status of the patients were noted. Educational status was categorized into 5 groups: non-literate, primary school graduates, secondary school graduates, high school graduates and university graduates. All patients underwent a full dermatologic examination, including the anogenital region. Patients in whom fungal infections were suspected were further evaluated by microbiological assessment culture and microscopy. Biopsy and histopathological evaluation were performed as required. Lesions were divided into six subgroups by location: penis, pubis, inguinal region, scrotum, perianal region and gluteal region. Age groups were defined as 18–29, 30–39, 40–49, 50–59, and over 60.

Incidences of lesions, distribution regarding location, and educational status and age of patients were analyzed.

Statistical Analysis

Statistical analysis was performed using SPSS 16.0 software (Chicago, IL, USA). Non-normally distributed continuous variables were expressed as a median and categorical variables were expressed as numbers and percentages. Mann Whitney U testing was used to compare the continuous variables, while the chi-square test was used to compare the categorical variables. Level of statistical significance was considered as $p < 0.05$.

Results

Ages of the patients ranged from 18 to 72 with a mean age of 40.49 ± 14.5 . Comorbid diseases were found in 12% of the patients. Two patients had been diagnosed with prostate and gastric malignancy. Demographic features of the patients are summarized in Table 1. All of the patients in the study were circumcised and regularly shave their genital hair. The most frequent group of diseases were infectious lesions, diagnosed in 59.3% of patients. HPV lesions were most frequently found in the penis, pubis, inguinal and perianal areas (Fig. 1). Among bacterial infections, the most frequent type was folliculitis and the most common location was pubic region (Fig. 2). Hidradenitis suppurativa was most frequently found in gluteal and inguinal regions (Fig. 3). Among fungal infections, the most common were dermatophyte types (Fig. 4). Infectious

Table 1. Demographic features of the MARL patients.

	N (%) N = 150
Age	
Min-max. (mean \pm SD)	18–72 (40.49 ± 14.5)
BMI (mean \pm SD)	19–37 (26.7 ± 4.0)
Education, n (%)	
None	1 (0.7)
Primary school	25 (16.7)
Secondary school	18 (12.0)
High school	52 (34.7)
University	54 (36.0)
Family history	18 (12)
Duration of disease (month) (mean \pm SD)	0.25–252 (33.6 ± 16.68)
Presence of comorbidities	
DM	18 (12)
HT	1 (0.7)
Astma	7 (4.6)
CAD	5 (3.3)
Gastritis	2 (1.3)
Malignancy	2 (1.3)

Abbreviations: DM, diabetes mellitus; HT, hypertension; CAD, coronary artery disease.

diseases were followed by inflammatory diseases, with a rate of 29.3%, and tumoral diseases, at 16%. Among inflammatory diseases, fixed drug eruption was the most common, accounting for 5.5% of the cases studied. In six of the patients the cause was cotrimoxazole, while in two the cause was doxycycline. In the tumoral group, the most common type was angiokeratoma. Three patients had soft fibroma, 1 had scrotal calcinosis (Fig. 5) and one had squamous cell carcinoma (SCC) (Fig. 6). 93.1% of the pubic lesions were infectious diseases. Incidences and distributions regarding location are summarized in Table 2. When patient age was analyzed, it was found that the most common group was 18–29 (29.3%). Distributions regarding age of all MARL patients are shown in Figure 7. Infectious diseases were the most common cause of lesions in the 18–29 age group (31.5%) and the 50–59 age group (29.5%). Patients' age distributions are summarized in Table 3.

Discussion

Anogenital region diseases are different in males and females. Structure and physiology of the skin, effects of sex hormones and environmental factors underlie these differences. In general, infectious skin diseases are more common in males than females.⁶ Other factors affecting the occurrence of anogenital lesions among the male population include circumcision, regular genital hair shaving, regular doctor visits and neglecting doctor visits because of embarrassment.

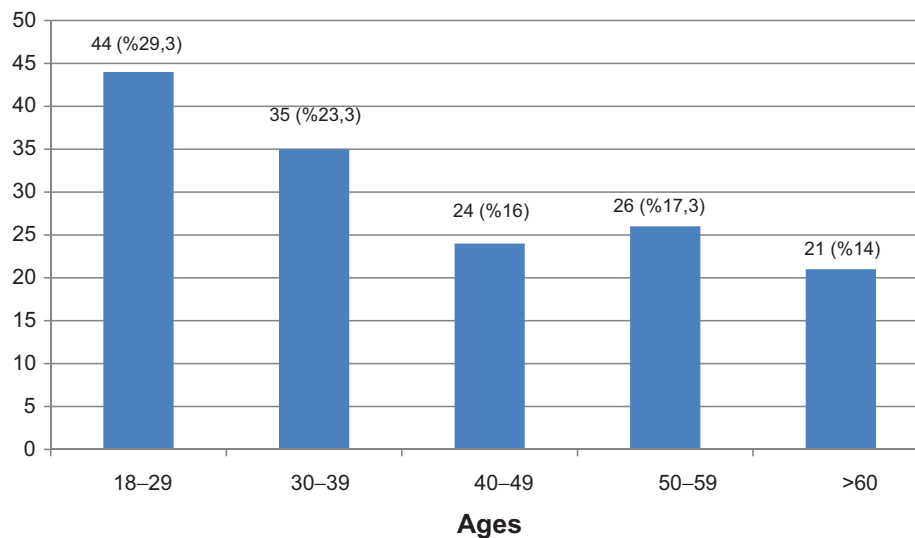


Figure 1. Distribution of MARL patients according to age.

The most common group of diseases among MARL was infectious diseases. In this group, genital warts related to HPV were the most common lesions. HPV infections in men may lead to a variety of diseases, from subclinical infection to genital squamous cell carcinoma. All HPV-related lesions in our patients were genital warts. Genital warts are common sexually transmitted diseases. In the US, yearly incidence among the sexually active population aged 15–49 has been found to be 1%.⁷ In our patients, 22.6% had genital warts, which is relatively high. The reason for this could be that the treatment for genital warts is mostly carried out by dermatology clinics in our country, so those with the disease presented disproportionately to our clinic. The most common age for genital warts is reported as 20–24 in US and Europe.⁷ In our patients, the most common groups were 18–29 and 30–39. In previous studies, the most common locations of HPV infections were the penis, scrotum and perianal region; pubic and inguinal regions were not mentioned.^{8–10} In our

study, the most common locations were the penis, pubis and inguinal region. In our study, the pubic region is found to be the second most common site of occurrence for genital warts. This result, in our opinion, might be explained by cultural and religious differences, such as regular shaving of the pubic area, which induces spreading of disease. Moreover, in our study, 93.1% of lesions in the pubic region were infectious diseases. This reinforces the theory that viral and bacterial infections could be more easily spread with regular shaving. Treatment modalities for HPV infections are cryotherapy, electrocauterization and CO₂ laser as destructive therapies.¹¹ Meanwhile, the application of hair removing ointments without spatula usage could be helpful in preventing the spread of these lesions.

Although Sarkar et al reported HSV as the most common viral infection in their study, HSV infections were found to be the second most common viral infection in our patients.¹² Clinically presenting with vesicle, pustule or ulcer



Figure 2. HPV lesions on perianal area.



Figure 3. Folliculitis on pubic region.



Figure 4. Hidradenitis suppurativa in scrotal and inguinal region.

formation, HSV infections are the most common reason for ulcer formation in the genital region.¹

Molluscum contagiosum, the third most common type of lesion in our study with a ratio of 6%, is generally presented with umbilicated papules.¹³ This finding was similar to the previously mentioned study by Sarkar et al.¹² The locations of molluscum in adults and children were compared in another study and the genital presentation in adults made up 23% of cases.¹³ In our study, the most common site of presentation was the pubic region. As with HPV, we suspect that the reason was pubic shaving, which leads to spreading of the disease.

The most common bacterial infections were folliculitis and frunculosis. These infections are caused by occlusion, maceration and chemicals and could also occur in other parts of the body. Retrovert shaving of the hair follicles, and usage of contaminated shaving utensils are the main causes of these infections.¹⁴ All patients using sharp shaving utensils and the



Figure 5. Dermatophyte infection on gluteal area.



Figure 6. Scrotal calcinosis in scrotal area.

pubic region being the most common location suggests that spreading of the lesions was mainly by shaving. Treatment consists of antibiotic ointments and education of the patients about proper shaving and genital care.

In our study, no bacterial balanitis or balanopostitis were found. We attributed this to the protective effects of circumcision.

The prevalence of Hidradenitis suppurativa in MARL has been reported between 0.03% and 4%;¹⁵ we found it to be 3.3% in our study. Most common locations were the gluteal region, inguinal region and scrotum respectively. In a study in which 302 patients were evaluated, Hidradenitis suppurativa was found to be more atypically located and more aggressive in males than females. Distribution of lesions regarding location were revealed as inguinal region, perineal-perianal region and gluteal region, which is different than our study. Also, high BMI was found to be a risk factor, while our study didn't find a meaningful relationship between high BMI and the incidence of Hidradenitis suppurativa.¹⁶

Fournier's gangrene, which we found in one patient, is a rare but important disease for dermatology practice. It can be described as a rapidly progressing, highly mortal necrotizing fasciitis of the male genital region.¹⁷ Major risk factors are diabetes mellitus (DM), prolonged catheterization, genitourinary surgery and trauma. Our patient had a history of DM for

**Table 2.** Incidences and distributions regarding location of MARL.

DISEASES	N (%)	PENIS (%)	PUBIS (%)	INGUINAL (%)	SCROTUM (%)	PERIANAL (%)	GLUTEAL (%)
	n:150	n:55 (36.6)	n:29 (19.3)	n:44 (29.3)	n:17 (11.3)	n:13 (8.6)	n:7 (4.6)
Infections	89 (59.3)	23 (41.8)	27 (93.1)	27 (61.3)	0 (0.0)	5 (38.5)	7 (100)
Viral	47 (31.3)	22 (40.0)	19 (65.5)	5 (11.3)	0 (0.0)	1 (7.7)	0 (0.0)
HPV	34 (22.6)	17 (31.0)	14 (48.3)	2 (4.5)	0 (0.0)	1 (7.7)	0 (0.0)
Molluscum	9 (6.0)	2 (3.6)	5 (17.2)	2 (4.5)	0 (0.0)	0 (0.0)	0 (0.0)
Herpes genitalis	4 (2.6)	3 (5.5)	0 (0.0)	1 (2.3)	0 (0.0)	0 (0.0)	0 (0.0)
Bacterial	12 (8.0)	0 (0.0)	5 (17.2)	3 (6.8)	0 (0.0)	0 (0.0)	4 (57.1)
Folliculitis-fronculosis	6 (4.0)	0 (0.0)	5 (17.2)	0 (0.0)	0 (0.0)	0 (0.0)	1 (14.3)
Hidradenitis suppurativa	5 (3.3)	0 (0.0)	0 (0.0)	2 (4.5)	1 (5.8)	0 (0.0)	3 (42.8)
Fornier	1 (0.6)	0 (0.0)	0 (0.0)	1 (2.3)	0 (0.0)	0 (0.0)	0 (0.0)
Fungal	28 (18.6)	0 (0.0)	2 (6.9)	19 (43.2)	0 (0.0)	4 (30.7)	3 (42.8)
Dermatophytes	19 (12.6)	0 (0.0)	2 (6.9)	13 (29.5)	0 (0.0)	2 (15.4)	2 (28.5)
Candida	7 (4.6)	0 (0.0)	0 (0.0)	4 (9.0)	0 (0.0)	2 (15.4)	1 (14.3)
Tinea Versicolor	2 (1.3)	0 (0.0)	0 (0.0)	2 (4.5)	0 (0.0)	0 (0.0)	0 (0.0)
Parasitoses	2 (1.3)	1 (1.8)	0 (0.0)	1 (2.3)	0 (0.0)	0 (0.0)	0 (0.0)
Scabies	1 (0.6)	1 (1.8)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Pediculosis pubis	1 (0.6)	0 (0.0)	0 (0.0)	1 (2.3)	0 (0.0)	0 (0.0)	0 (0.0)
Inflammatory	44 (29.3)	15 (27.3)	2 (6.9)	13 (29.5)	8 (47.0)	6 (46.1)	0 (0.0)
Intertrigo	16 (10.6)	0 (0.0)	0 (0.0)	10 (22.7)	2 (11.7)	4 (30.8)	0 (0.0)
Fixed drug eruption	8 (5.3)	8 (14.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
LSC	7 (4.6)	0 (0.0)	0 (0.0)	2 (4.5)	3 (17.6)	2 (15.4)	0 (0.0)
ACD	6 (4.0)	2 (3.6)	2 (6.6)	1 (2.3)	1 (5.8)	0 (0.0)	0 (0.0)
Lichen planus	4 (2.6)	4 (7.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
ICD	2 (1.3)	0 (0.0)	0 (0.0)	0 (0.0)	2 (11.7)	0 (0.0)	0 (0.0)
Psoriasis	1 (0.6)	1 (1.8)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Tumors	24 (16.0)	14 (25.5)	1 (3.4)	2 (4.5)	6 (35.3)	1 (7.7)	0 (0.0)
Angiokeratoma	17 (11.3)	12 (21.8)	0 (0.0)	0 (0.0)	5 (29.4)	0 (0.0)	0 (0.0)
Soft fibroma	3 (2.0)	0 (0)	0 (0.0)	2 (4.5)	0 (0.0)	1 (7.7)	0 (0.0)
Pearly penile papules	2 (1.3)	2 (3.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
SCC	1 (0.6)	0 (0.0)	1 (3.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Scrotal calcinosis	1 (0.6)	0 (0.0)	0 (0.0)	0 (0.0)	1 (5.8)	0 (0.0)	0 (0.0)
Ulcer	3 (2.0)	0 (0.0)	0 (0.0)	1 (2.3)	2 (11.7)	0 (0.0)	0 (0.0)
Behcet	1 (0.6)	0 (0.0)	0 (0.0)	0 (0.0)	1 (5.8)	0 (0.0)	0 (0.0)
Syphilis	1 (0.6)	0 (0.0)	0 (0.0)	0 (0.0)	1 (5.8)	0 (0.0)	0 (0.0)
Iatrogenic	1 (0.6)	0 (0.0)	0 (0.0)	1 (2.3)	0 (0.0)	0 (0.0)	0 (0.0)
Pigmentations	3 (2.0)	3 (5.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Vitiligo	2 (1.3)	2 (3.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Postinflammatory hyperpigmentation	1 (0.6)	1 (1.8)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Others	1 (0.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (7.7)	0 (0.0)
Hemorrhoid	1 (0.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (7.7)	0 (0.0)

Abbreviations: HPV, human papilloma virus; LSC, lichen simplex chronicus; ACD, allergic contact dermatitis; ICD, irritant contact dermatitis; SCC, squamous cell carcinoma.



Figure 7. Squamous cell carcinoma in pubic area.

16 years but none of the other risk factors. Urgent management is required in Fournier's disease, so prompt diagnosis increases survival rates.¹⁷

The most common fungal infection in our patients was dermatophytes, accounting for 12% of studied cases, and the most common location was the inguinal region. This percentage is higher than the study of Aribogan et al, in which the tinea cruris incidence of random urology outpatient clinic patients was stated as 7.7%.¹⁸ This difference could be explained by the more common presentation of tinea cruris patients to dermatology outpatient practice. No candidal balanitis or balanopostitis were found in our patients.

Pediculosis pubis, a sexually transmitted parasitic infection, is rare in our country. This might be attributed to shaving habits. We observed pediculosis pubis in only in one patient, in inguinal hair follicles, although the patient had no hair in the pubic area.

Fixed drug eruption is characteristically a purplish, well-defined macule, presenting every time at the same place after drug consumption. It can sometimes be bullous or ulcerative in formation. In a study of drug eruptions in the male genital region in 28 patients, it was stated that the most common location of lesions was the penis and the most common drug was cotrimoxazole. These findings were the same as the findings of our study.¹⁹

Since anogenital skin is thin and elastic, it is easily effected by allergic and irritant substances.¹ Application of alcohol-based colognes onto the genital region with the thought of killing bacteria, a practice common amongst our patient population, could also worsen the problem.

Table 3. Distribution of the diseases according to age.

	18–29 N (%)	30–39 N (%)	40–49 N (%)	50–59 N (%)	>60 N (%)
Infections	28 (31.5)	20 (22.5)	16 (18.0)	15 (16.9)	10 (11.2)
Viral	17 (36.2)	14 (29.8)	7 (14.9)	7 (14.9)	2 (4.3)
HPV	11 (32.4)	11 (32.4)	5 (14.7)	5 (14.7)	2 (5.9)
Bacterial	3 (25.0)	2 (16.7)	2 (16.7)	3 (25.0)	2 (16.7)
Fungal	5 (17.9)	6 (21.4)	7 (25.0)	6 (21.4)	4 (14.3)
Inflammatory	10 (22.7)	8 (18.2)	7 (15.9)	13 (29.5)	6 (13.6)
Tumor	5 (20.8)	6 (25.0)	2 (8.3)	4 (16.7)	7 (29.2)
Ulcer	0 (0.0)	2 (66.6)	1 (33.3)	0 (0.0)	0 (0.0)
Pigment	0 (0.0)	1 (50.0)	1 (50.0)	0 (0.0)	0 (0.0)

We found one patient with psoriasis, a generalized skin disease that can affect the genital region too.² Glans penis is the most common location and initial presentation is generally a red papule on the glans penis in circumcised males.²⁰ Even though our patient stated that he didn't have any other lesions, in his examination guttate psoriasis lesions on his elbows were noted. A thorough examination is always required to rule out generalized diseases.

Lichen simplex chronicus (LSC) is common on the scrotum. In our study, the most common location was also the scrotum. The next most common locations were the inguinal and perianal regions. In a study in which anogenital LSC was analyzed in 59 patients, the common locations were listed as scrotum, perineum and perianal region.²¹ Psychiatry consultation is needed to point out the anxiety level and the presence of depression as etiological factors.²²

The most common tumoral lesions of the anogenital region in our study were angiokeratomas on the scrotum and perineum, consistent with the literature.²³ Patients presented to the dermatology outpatient clinic with pearly penile papules, and many expressed anxiety that these might indicate a serious disease. Differential diagnosis with genital warts should be made since treatment modalities are different.²⁴ Idiopathic scrotal calcinosis, found in one of our patients, is a rare benign condition presenting with rock hard nodules in the scrotal dermis. Most of these nodules are asymptomatic but sometimes itching and fluid drainage might occur.²⁵ This patient was referred to the plastic surgery clinic and had several surgeries for excision and reconstruction.

Penile SCCs are 3.2 times more common in uncircumcised males when compared with males circumcised early after birth.²⁶ Even though penile SCC is rare among circumcised males, in one case in our study it occurred in the anogenital region, rather than on the penis. The patient declared that the lesion was present for one year but he was ashamed to visit a doctor. This is an important factor in increased morbidity of patients.

Anogenital ulcer in one patient was diagnosed as Behçet's disease, which is common in Turkey. Genital ulcer is common in Behçet's disease, and found in 57%–93% of Behçet's patients. The scrotal region, as in our patient, is the most common location for ulcers.²⁷ Although the incidence of the disease varies between communities, the differential diagnosis of genital ulcers must be kept in mind. Iatrogenic factors are also present in the etiology of the ulcers. In one patient with a genital ulcer, it was learned from his history that he had sessions of cryotherapy in another clinic. Pain, bullae formation and ulcer are complications of cryotherapy, and as the time of application increases, the incidence of complications increases as well.²⁸

In this study, the incidence of isolated genital region vitiligo among all genital lesions was found to be 1.3%. Vitiligo, which is characterized by melanocyte degradation, was found in two of our patients. In a previous study from Turkey, genital presentation of vitiligo was reported as 26.06%.²⁹

Conclusion

It is important to perform a full dermatologic and systemic examination for MARL. Patients' ethnicity and cultural habits should also be considered, because these can account for some differences in incidence and presentation of dermatologic problems. Our study population of circumcised males with the habit of regular anogenital shaving is different than other populations mentioned in English literature. No balanitis and balanopostitis were reported in our study and HPV, molluscum and folliculitis were found to be common in the pubic region. To conclude, knowledge of the incidence, location, management options, differences and predisposing factors of MARL is important in their precise diagnosis and treatment, and also for prevention of unnecessary surgical therapies.

Author Contributions

Conceived and designed the experiments: DDD. Analyzed the data: DDD, OO. Wrote the first draft of the manuscript: DDD. Contributed to the writing of the manuscript: DDD, CC, SE, OO. Agree with manuscript results and conclusions: DDD, CC, SE, OO, MFO, AM. Jointly developed the structure and arguments for the paper: DDD, SE. Made critical revisions and approved final version: DDD, SE, MFO, AM. All authors reviewed and approved of the final manuscript.

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