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OPTIC NEURITIS IN MEKNES: A SINGLE-CENTER RETROSPECTIVE STUDY OF 20 CASES

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ABSTRACT

Introduction: Optic neuritis (ON) is an inflammatory demyelinating disorder of the optic nerve, frequently associated with multiple sclerosis (MS) . The epidemiology and clinical spectrum of ON in North African populations remain poorly described.
Methods: This retrospective study analyzed 20 cases of ON diagnosed at Moulay Ismail Hospital, Meknes, Morocco, from 2016 to 2024. Clinical presentation, imaging, laboratory findings, and progression to MS were reviewed.
Results: Patients ranged from 17–56 years (mean age 33 ± 11.3 years); 75% were female. Eleven cases were unilateral and nine bilateral. Ocular pain occurred in 50% and papilledema in 35%. Visual field and visual evoked potential (VEP) abnormalities were found in 85% and 80% of patients, respectively . Brain MRI revealed optic nerve thickening in 25% of patients. Three patients (15%) developed MS during follow-up. The incidence of optic disc swelling was higher than that reported in the Optic Neuritis Treatment Trial (ONTT) , whereas the frequency of ocular pain, periventricular plaques, and MS development was lower.
Conclusion: Moroccan patients with ON exhibit distinct clinical and imaging characteristics compared with Western and Middle Eastern cohorts , suggesting potential ethnic and environmental variations in disease expression.

KEYWORDS

Optic neuritis; Multiple sclerosis; MRI; Morocco

MAIN ARTICLE

INTRODUCTION

Optic neuritis (ON) is a demyelinating inflammation of the optic nerve leading to acute visual loss and periocular pain [2,3]. It is often the first manifestation of multiple sclerosis (MS) but may also occur as an isolated, idiopathic, or autoimmune event associated with neuromyelitis optica spectrum disorder (NMOSD) or MOG antibody-associated disease (MOGAD) [1]. Clinically, ON presents with sudden unilateral or bilateral vision loss, dyschromatopsia, relative afferent pupillary defect (RAPD), and occasionally papilledema. Magnetic resonance imaging (MRI) remains the most sensitive diagnostic tool for detecting optic nerve inflammation and central nervous system demyelination [2,3].

The Optic Neuritis Treatment Trial (ONTT) established corticosteroid therapy as the standard of care and clarified the long-term risk of MS following ON [2,4]. Despite substantial global research, few data exist for North African populations, where epidemiological and genetic differences may influence disease presentation.

This study aims to describe the clinical, radiological, and laboratory features of ON in Moroccan patients and to compare these findings with data from the ONTT and Hajjar et al.'s Middle Eastern study [1–3].

METHODS

Study Design and Setting

A retrospective review was conducted of 20 patients diagnosed with ON at Moulay Ismail Hospital, Meknes, Morocco, between January 2016 and December 2024.

Inclusion and Exclusion Criteria

Patients aged 17–56 years presenting with acute or subacute visual loss consistent with ON were included. Exclusion criteria (Table 1) encompassed ischemic, compressive, traumatic, or toxic optic neuropathies; systemic diseases such as lupus or leukemia; and medication or toxin exposure.

Table 1. Major Exclusion Criteria

- Pre-existing ocular abnormalities affecting vision
- Ischemic, compressive, or traumatic optic neuropathy
- Systemic diseases (e.g., lupus, leukemia)
- Use of neurotoxic drugs (e.g., ethambutol, phenothiazines)
- Alcohol or toxin exposure
- Brain tumors

Data Collection

Each patient underwent a standardized ophthalmologic and neurologic examination, including:

- Visual acuity and color vision testing
- Fundoscopic examination for optic disc changes
- Visual field testing
- Visual evoked potential (VEP) analysis
- Brain and spinal MRI
- Lumbar puncture and laboratory tests (ANA, VDRL, CBC, ESR)

Clinical history addressed previous ON episodes, viral infections, autoimmune conditions, vaccination, and toxin exposure. Bilateral ON was defined as involvement of both eyes within one week.

Diagnostic Classification

Diagnoses of MS, NMOSD, and MOGAD were based on the **2017 McDonald**, **2015 International Consensus**, and **2018 MOGAD** criteria, respectively. Patients were considered idiopathic when these conditions and infectious causes were excluded.

Statistical Analysis

Data were analyzed using SPSS v26. Continuous variables were expressed as mean ± SD. Categorical data were summarized as frequencies and percentages. Student's *t*-test and chi-square tests were used where appropriate ($p < 0.05$ considered significant).

RESULTS

Demographic and Clinical Features

Among 20 patients, 15 (75%) were female. The mean age was 33 ± 11.3 years. Eleven (55%) had unilateral ON and nine (45%) bilateral involvement. Visual acuity loss occurred in 85%, ocular pain in 50%, and papilledema in 35%. Other symptoms included dyschromatopsia (25%), RAPD (30%), and reduced contrast sensitivity (10%).

Paraclinical Findings

Visual field defects were observed in 85% of patients, predominantly diffuse or temporal/nasal defects. VEP abnormalities were detected in 80% (90% of unilateral cases, 66.7% of bilateral cases), primarily delayed latency and reduced amplitude.

MRI was performed in all patients; optic nerve thickening was observed in 25%. Spinal MRI was conducted in 6 patients. White matter lesions suggestive of demyelination were seen in 3 patients, all of whom later developed MS.

Etiological Distribution

Most cases were idiopathic (75%). Three patients (15%) developed MS during follow-up, and two (10%) were antibody-associated (one AQP4-positive, one MOG-positive). Four patients showed elevated ESR.

Table 2. Clinical Characteristics by Laterality

Characteristic	Unilateral (n = 11)	Bilateral (n = 9)	*p*-value
Female sex	8 (72.7%)	7 (77.8%)	—
Mean age (years)	31.5	35.4	—
Periocular pain	4 (36.4%)	6 (66.7%)	—
Papilledema	5	2	—
Average VA (Monnoyer)	3.5 ± 0.68	2.58 ± 0.14	0.001

Treatment and Outcomes

All patients received intravenous corticosteroids followed by oral tapering. Patients with MS also received interferon β-1a. Most showed visual improvement, though residual deficits persisted in a minority. Three patients converted to MS during follow-up.

DISCUSSION

Main Findings

This study adds to the growing body of research on optic neuritis in Moroccan patients. It highlights a predominance among young women, consistent with international data, but with notable differences—particularly higher rates of papilledema and lower MS conversion rates compared with ONTT and Hajjar et al. (2024).

Comparison with Other Studies

Compared with ONTT and the Middle Eastern cohort (Table 3), Moroccan patients had less frequent eye pain (50% vs. 72–92%), fewer periventricular plaques (10% vs. 49%), and more papilledema (50% vs. 18–35%). Only 15% developed MS, much lower than the 50% conversion rate observed in ONTT.

Table 3. Comparison with ONTT and Middle Eastern Data

Characteristic	Present Study	Hajjar et al. (2024)	ONTT
Eye pain	50%	72%	92%
Periventricular plaques	10%	—	49%
Papilledema	35%	18%	35%
ON associated with MS	15%	62%	13%

These differences may reflect genetic or environmental factors, or limited MRI access reducing lesion detection rates. The predominance of idiopathic cases (75%) contrasts sharply with MS-associated ON in Middle Eastern and Western cohorts.

Clinical Implications

The lower rate of MS and higher incidence of bilateral involvement suggest a different disease spectrum in Moroccan patients, emphasizing the need for broader access to antibody testing (AQP4, MOG) and MRI. Early identification of autoimmune-associated ON could improve management and prevent relapses.

Limitations

Limitations include the small sample size, single-center design, and lack of OCT data, which restricts structural correlation. MRI reports varied in detail, and antibody testing was limited to a subset of patients. Selection bias may have influenced the findings.

CONCLUSION

Retrobulbar optic neuritis in Morocco presents unique clinical features, with a predominance of idiopathic cases and a lower rate of MS conversion than in Western cohorts. Early diagnosis, comprehensive neuroimaging, and targeted immunological testing are essential for optimizing management. Future multicenter studies incorporating OCT and serological biomarkers are warranted to refine regional diagnostic and therapeutic strategies.

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