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Cost-effectiveness of ofatumumab for the treatment of relapsing forms of multiple sclerosis in the United Arab Emirates

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Abstract

Background: Multiple sclerosis (MS) is an autoimmune disease of the central nervous system, associated with demyelination and inflammation. Relapsing forms of MS (RMS) encompass all patients with MS experiencing relapses. While there is currently no cure for MS, the introduction of several disease-modifying therapies (DMTs) has significantly reduced the risk of relapse and disability in patients with MS. There is a high unmet need for an easy-to-administer DMT that can be used early in the treatment pathway.

Objectives: This study aimed to evaluate the cost-effectiveness of ofatumumab compared with other commonly used DMTs for the treatment of RMS from a health payer perspective in the United Arab Emirates (UAE).

Design: A cost-effectiveness analysis.

Methods: A Markov model, based on expanded disability status scale (EDSS) health states, was developed using the UAE payer's perspective and a 65-year time horizon. The baseline patient distribution across the EDSS states was aligned to the population of ASCLEPIOS I and II trials. The British Columbia database informed natural history transition probabilities. Treatment effects were applied by delaying disability progression and reducing the number of relapses and were sourced from a network meta-analysis. The health care resource utilization was derived from interviews with local experts, who also validated the model structure and comparators, and utility inputs from published studies. In the absence of an officially defined willingness-to-pay threshold in the UAE, it was assumed to be United Arab Emirates Dirham (AED) 369,854 per quality-adjusted life-year (QALY), which is twice the UAE gross domestic product per capita.

Results: Base-case results indicated that ofatumumab was dominant over ocrelizumab, dimethyl fumarate, fingolimod, and natalizumab intravenous; was more cost-effective compared with teriflunomide, fingolimod (generic), glatiramer acetate, interferons, and best supportive care; and resulted in an incremental cost-effectiveness ratio of AED 713,068 per QALY versus cladribine. Sensitivity analyses were in line with the results of the base-case analysis.

Conclusion: From the UAE payer's perspective, ofatumumab could be a cost-effective treatment alternative for patients with RMS.

Keywords: cost-effectiveness, ofatumumab, relapsing-remitting multiple sclerosis

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Introduction

Multiple sclerosis (MS) is a chronic, autoimmune, inflammatory disease of the central nervous system, characterized by inflammation and demyelination, leading to the destruction of the myelin sheaths covering nerve axons. This damage can slow down or even block neural transmission to and from the brain and spinal cord, resulting in loss of motor function and severe disability.[1] Relapsing MS (RMS) encompasses all patients with MS experiencing relapses, such as clinically isolated syndrome and relapsing-remitting MS (RRMS) and relapsing secondary progressive MS (SPMS), whereas progressive forms of MS include non-relapsing SPMS and primary progressive MS.[2]

The prevalence of MS in the Emirati population was estimated at between 54.77 per 100,000 in 2007 and 64 per 100,000 (age standardized) in 2014.[3,4] The annual incidence rate has been reported at 6–6.8 per 100,000.[4] The prevalence of MS is 2.85 times higher in women than in men, and the mean age of onset is 27 years.[4] MS has a significant detrimental and highly debilitating impact on the quality of life for people with MS and their families.[5–7]

Although there is currently no cure for MS, several disease-modifying therapies (DMTs) are available that reduce the frequency of relapses and disease progression. Currently, many DMTs are approved for the treatment of RMS in the United Arab Emirates (UAE). The Middle East North Africa Committee for Treatment and Research in Multiple Sclerosis (MENACTRIMS 2019) guidelines recommend the following DMTs for the management of patients with mild to moderately active disease: interferons, glatiramer acetate, teriflunomide, and dimethyl fumarate (DMF). Fingolimod, siponimod, natalizumab intravenous (IV), ocrelizumab, and cladribine can be initiated in patients with highly active disease; and natalizumab IV, ocrelizumab, or alemtuzumab can be prescribed for patients with rapidly evolving aggressive disease, after careful risk stratification.[8]

A network meta-analysis (NMA) ranked ofatumumab, the first fully human monoclonal anti-CD20 antibody, among the most efficacious DMTs with respect to disease progression and reduction in relapse rates.[9] It is subcutaneously administered once a month and is the first therapy of its kind that patients can self-inject at home.[10] Ofatumumab has also demonstrated a favorable safety profile in the ASCLEPIOS trials.[11]

In addition to efficacy and safety data, health care decision-makers should consider an economic evaluation of new DMTs because of the high costs linked with DMTs and the chronic nature of MS, which justifies a prolonged disease course.[12] To the authors' knowledge, there is currently no published economic evaluation reporting the cost-effectiveness of DMTs from the UAE payer perspective. This study aimed to evaluate the cost-effectiveness of ofatumumab compared with other available DMTs from the UAE payer perspective.

Methods

The current study is a pharmacoeconomic modeling study that was developed using a Markov model to perform a cost-effectiveness analysis of ofatumumab compared with other available DMTs from the UAE payer perspective. The model inputs (efficacy, safety, and costs) were sourced based on secondary desktop research and expert opinion. No patient data were used in this study. This study has been conducted following the International Society for Pharmacoeconomics and Outcomes Research guidelines.[13,14]

Ethical consideration

As no patient data were used in this study, no approval from any ethics committee/Institutional Review Board or other authorized body was required. The study obtained opinions from physicians/experts using a questionnaire. As no patient participated in this interview, obtaining written consent was not applicable.

Setting and perspective

The model was developed from the UAE payer's perspective and included only direct medical costs. A willingness-to-pay threshold of United Arab Emirates Dirham (AED) 369,854/quality-adjusted life-year (QALY; twice the per capita gross domestic product in the UAE) was assumed, as there is no country-specific value. The 2022 UAE gross domestic product per capita was USD 50,348.816[15] (exchange rate: 1 USD = 3.67250 AED[16]). Costs and outcomes were discounted at 3.5%.

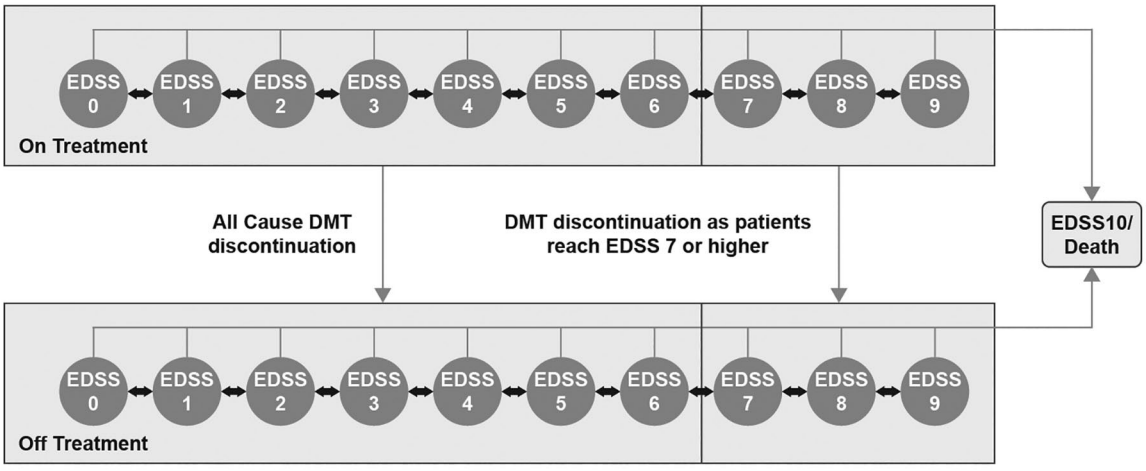

Figure 1. Model structure: a cohort of patients with RMS distributed between different EDSS health states, as observed in the ASCLEPIOS I and II trials, entered the model. During the model time horizon, patients could remain in the same EDSS state, move to a higher or lower EDSS state, experience a relapse, or move to EDSS 10 (death).
Source: This figure has been adapted with the necessary permissions from Novartis AG.
DMT, disease-modifying therapy; EDSS, expanded disability status scale; RMS, relapsing multiple sclerosis.

Model structure

A discrete-time Markov model, based on expanded disability status scale (EDSS) health states (EDSS 0 = neurologically normal; EDSS 10 = death),[17] was developed in Microsoft Excel. The model structure was adapted from an earlier model for ofatumumab used for country adaptations.[18–20] An annual cycle length and a 65-year time horizon were employed because all the patients would have died by then. A cohort of patients with RMS distributed between different EDSS health states, as observed in ASCLEPIOS I and II trials, entered the model. During the model time horizon, patients could remain in the same EDSS state, move to a higher or lower EDSS state, experience a relapse, or die (Figure 1). The proportion of patients who discontinued treatment was calculated based on the drug discontinuation probability.[9] After discontinuation, the patient was removed from the treatment and transferred to best supportive care (BSC). Cost and utilities were assigned to each EDSS state and treatment-related adverse event (AE). Treatment effects were applied in the model as changes to relapse frequency and disability progression risk and the associated changes in health state-related costs and utilities. Model outcomes were differences in costs and QALYs between ofatumumab and each individual comparator, which was presented as the incremental cost-effectiveness ratio (ICER).

Treatment comparisons

The primary intervention was ofatumumab administered as per the licensed dose in ASCLEPIOS I and II trials.[11] Comparators were selected based on the treatment consensus for the Arabian Gulf[21] and the MENACTRIMS guidelines,[8] and were validated by a panel of UAE-based clinical experts. The main comparators included ocrelizumab, cladribine, natalizumab IV, fingolimod, beta-interferons, glatiramer acetate, teriflunomide, DMF, and BSC. Alemtuzumab was not deemed to be an appropriate comparator since it is only recommended in patients with rapidly worsening, severe disease due to the increased risk of serious and life-threatening safety concerns placing potential restrictions on the use of the product.[8,22] However, for inclusiveness, the alemtuzumab results are presented in the Supplemental Material.

Input parameter values

Population demographics. The baseline patient distribution across EDSS states was in line with the ASCLEPIOS I and II trials.[11] Based on a consensus among the local experts, the mean age of the cohort was 27 years, with 32% male patients (Table 1).

Natural history. Transition probabilities between EDSS states of the untreated cohort, which projects the natural history of disability worsening for

Table 1. Characteristics of the baseline population.

Characteristics	Value	SE	Source
Size of the population	1881	–	Number of baseline RMS patients in ASCLEPIOS I and II trials
Initial EDSS scores			
0	2.34%	–	Pooled analysis of ASCLEPIOS I and II trials
1	19.14%	–	Pooled analysis of ASCLEPIOS I and II trials
2	28.07%	–	Pooled analysis of ASCLEPIOS I and II trials
3	22.12%	–	Pooled analysis of ASCLEPIOS I and II trials
4	17.60%	–	Pooled analysis of ASCLEPIOS I and II trials
5	9.84%	–	Pooled analysis of ASCLEPIOS I and II trials
6	0.90%	–	Pooled analysis of ASCLEPIOS I and II trials
7	0.00%	–	Pooled analysis of ASCLEPIOS I and II trials
8	0.00%	–	Pooled analysis of ASCLEPIOS I and II trials
9	0.00%	–	Pooled analysis of ASCLEPIOS I and II trials
Percentage of males	32.00%	0.011	UAE expert opinion
Age of cohort (years)	27.0	0.270	UAE expert opinion
Years since diagnosis	5.6	0.562	Pooled analysis of ASCLEPIOS I and II trials

EDSS, expanded disability status scale; RMS, relapsing multiple sclerosis; SE, standard error; UAE, United Arab Emirates.

patients receiving BSC, were based on the British Colombia longitudinal observational cohort[23] (Table S1), which is considered to be the most appropriate natural history cohort for cost-effectiveness models in RMS.[24] This data source does not separately model RRMS and SPMS transitions and, hence, the model assumes that patients with SPMS continued to be treated and subjected to the same natural history of EDSS transitions. In line with previous economic models, EDSS-dependent natural history annualized relapse rates (ARR) were informed by published sources[25,26] (Table S2). Relapse severity was derived from a panel of local clinical experts (mild, 50%; moderate, 40%; severe, 10%). Age- and sex-specific all-cause mortality rates for the UAE general population[27] were adjusted for the MS population using an EDSS-independent MS-specific hazard ratio (HR).[28]

Treatment efficacy and duration of treatment. For the treatment-adjusted cohort, the HR for time to 6 months confirmed disability progression, and the rate ratio for ARR was sourced from an NMA[9] (Table S3). The annual discontinuation rates for ofatumumab and other DMTs were sourced from ASCLEPIOS trials and the NMA,[9,11] and were applied over the model's time horizon. The base-case analysis assumed no waning of treatment efficacy, as data are limited, and the inclusion of waning may be considered double counting of discontinuations.

Costs

Direct medical costs (such as drug acquisition, monitoring and administration costs, and relapse costs) and EDSS-specific costs were sourced from both published literature and expert opinion (Tables 2 and 3 and Tables S4 and S5). Due to the lack of published evidence, a number of semi-structured interviews were performed to elicit health care resource utilization (HCRU) associated with the administration and monitoring of DMTs, management of relapses (mild, moderate, and severe), and EDSS health states. The questionnaire

Table 2. Costs by health state.

EDSS state	Direct medical cost (SE), AED
0	6672 (667)
1	11,704 (1170)
2	11,704 (1170)
3	11,704 (1170)
4	41,666 (4167)
5	41,666 (4167)
6	41,666 (4167)
7	38,991 (3899)
8	109,055 (10,906)
9	106,977 (10,698)
10	0 (0)

AED, United Arab Emirates Dirham; EDSS, expanded disability status scale; SE, standard error.

Table 3. Costs of relapse.

Relapse type	Direct medical cost (SE), AED
Mild	411 (41)
Moderate	10,588 (1059)
Severe	14,903 (1490)

AED, United Arab Emirates Dirham; SE, standard error.

developed for the interviews was validated by a clinical expert in the field of MS. The questionnaire was not a tool for analysis (such as patient-reported outcomes); rather, it only helped collect the inputs for this model and is provided separately as a Supplemental File. The estimated HCRU was then validated during a roundtable discussion including 12 experts. Unit costs of health care resources from the Daman Published Rates were then applied to these resource utilization estimates[29]; drug unit costs were obtained from the Shafafiya Combined Drugs Reference Price List.[30] All costs were reported in 2022 prices in local currency (AED). The cost of a nonserious AE was assumed to be the cost of an outpatient visit, while the cost of a serious AE was assumed to be the cost of a single visit to the accident and emergency department.

Utilities. Utility weights for EDSS states were derived from a UK prospective, longitudinal, cohort study[31] for the RRMS states and supplemented by SPMS-related state utilities estimated in the UK MS survey[26] (Table 4). A disutility of a recent relapse of 0.02 was applied to all relapses, irrespective of severity.[26] Disutilities for drug-related AEs were applied in the model. It was assumed that a nonserious AE resulted in a 0.25 disutility and was experienced for 7 days (annual disutility of approximately 0.005). For a serious AE, a disutility of 0.5 was applied for 1 month, resulting in an annual disutility of approximately 0.041.

Adverse events. The number of patients experiencing at least one AE and those experiencing a serious AE were recorded from each of the pivotal trials to calculate the annual probabilities. AE probabilities were assumed constant for the duration of treatment with a particular medication. These probabilities—along with the costs, disutilities, and duration of serious and nonserious AEs—were used to calculate the average annual cost and QALYs lost due to AEs for each DMT (Table S6).

Model assumptions. The following model assumptions have been made in the base-case analysis: patients with SPMS continue to be treated and are subject to the same natural history of EDSS transitions as patients with RRMS; EDSS health state is the primary determinant of health state costs and valuation of health effects (utilities); EDSS health state does not impact mortality; patients discontinuing treatment do not switch to another DMT; patients who reach the EDSS treatment threshold of 7 (i.e., patients in EDSS 7 or above) are automatically assumed to discontinue treatment and receive BSC; discontinuation rates from the NMA are applied over the model's time horizon; no waning of treatment efficacy is assumed.

Base-case and sensitivity analyses. The model estimated the following outcomes: total costs, QALYs; incremental costs, QALYs; and incremental cost per QALY gained for the base-case input parameter values. Several sensitivity analyses, including scenario analyses using alternative model input parameter values, one-way sensitivity analysis (OWSA), and probabilistic sensitivity analyses (PSA), were performed.

The base-case analysis assumed cladribine tablets were administered in two cycles, separated by

Table 4. Base-case utility scores per EDSS state.

EDSS state	Utility (SE)	Source
0	0.897	Hawton and Green[31] (RRMS)
1	0.763	Hawton and Green[31] (RRMS)
2	0.719	Hawton and Green[31] (RRMS)
3	0.523	Hawton and Green[31] (RRMS)
4	0.596	Hawton and Green[31] (RRMS)
5	0.438	Hawton and Green[31] (RRMS)
6	0.500	Hawton and Green[31] (RRMS)
7	0.297	Orme et al.[26]
8	−0.049	Orme et al.[26]
9	−0.195	Orme et al.[26]

EDSS, Expanded Disability Status Scale; RRMS, relapsing-remitting multiple sclerosis; SE, standard error.

12 months, with no further retreatment. A scenario analysis explored the impact of retreatment with cladribine beyond Year 4. This was a pragmatic approach, where a percentage of patients were retreated with cladribine from Year 5 onward. For ofatumumab and cladribine, this analysis assumed a discontinuation rate from the NMA for 2 years and a constant discontinuation rate of 0% afterward. An additional scenario analysis was conducted to explore the impact of applying an alternative set of utility weights obtained from Orme et al.[26] In the base-case analysis, the National Institute for Health and Care Excellence guidelines were followed to assume a discounting rate of 3.5% as a default[32] due to the absence of an official discounting rate for use with UAE-specific economic evaluations. An alternative discounting rate of 1.5% was explored in a scenario analysis.

An OWSA was conducted to address parameter uncertainty and identify parameters that have maximum effect on the net monetary benefit (NMB; for input parameters, see Table S7 in the Supplemental Material). Uncertainty in model input parameters was examined in the PSA, wherein all input parameters, apart from drug costs, which were known with certainty, were simultaneously varied using prespecified distributions reflecting the uncertainty about their true values. Following distributions were used for 1000 repeated model simulations: gamma distributions for the cost inputs; log-normal distributions for the efficacy parameters, treatment and AE disutility estimates, relative risk of mortality, and natural history relapse rates; Dirichlet for patient proportions per EDSS state and relapse severity; and beta distributions for AE rates and discontinuation rates.

Model validation. Face validity of the model structure and input parameters was ensured by expert reviews involving nine clinical and three health economics experts in the UAE. Input data sources and model assumptions were also validated by the UAE clinical experts. Expert opinion was informed by nine clinical experts and three health economics experts at an advisory board meeting, where the model inputs were reviewed and discussed until a consensus was reached. Internal validity was assured by a review of all calculations and data inputs. Tests with null input values were conducted to ensure the model findings were consistent with expectations. Cross-validity (comparison of results with other published models) could not be performed because no suitable studies were identified (those addressing the same decision problem using a different model structure).

Reporting guideline. This manuscript has been prepared based on Consolidated Health Economic Evaluation Reporting Standards 2022 (CHEERS2022),[33] and a separate Supplemental File of the CHEERS2022 checklist has been provided.

Results

Base-case analysis results

Base-case results with a 65-year time horizon indicated that ofatumumab was dominant (less costly and more effective) over ocrelizumab, DMF, fingolimod, and natalizumab IV (Table 5). Ofatumumab was cost-effective compared with teriflunomide, fingolimod (generic), glatiramer acetate, interferons, and BSC. Ofatumumab resulted in an ICER of AED 713,068 per QALY when compared with cladribine (Table 5).

Sensitivity analysis results

Scenario analyses. The scenario analysis where the annual cladribine retreatment rate was increased gradually from 0% showed that at the

Table 5. Results of the base-case analysis.

Drug name	Discounted costs (AED)[a]	Discounted QALYs[a]	Ofatumumab vs other DMT		
			Incremental costs (AED)	Incremental QALYs	ICER (AED/QALY)
Ofatumumab	1,644,872	10.84	NA	NA	NA
Ocrelizumab	1,921,687	10.67	−276,815	0.17	Dominant[b]
Natalizumab IV	2,080,112	10.66	−435,240	0.18	Dominant[b]
Fingolimod (branded)	2,107,911	10.02	−463,039	0.82	Dominant[b]
Teriflunomide	1,457,383	9.61	187,489	1.23	152,800
DMF	1,778,855	9.94	−133,982	0.90	Dominant[b]
Glatiramer acetate	1,497,043	9.72	147,830	1.12	132,035
Interferon-beta-1a (Brand 1)	1,533,008	9.81	111,865	1.03	108,221
Interferon-beta-1a (Brand 2)	1,447,922	9.58	196,950	1.26	156,433
Interferon-beta-1b	1,521,687	9.72	123,185	1.12	110,334
Fingolimod (generic)	1,494,463	10.02	150,409	0.82	184,129
BSC	1,230,765	9.22	414,107	1.62	256,238
Cladribine	1,480,635	10.61	164,237	0.23	713,068

[a]Discounted at 3.5%.
[b]Ofatumumab is less costly and more effective.
AED, United Arab Emirates Dirham; BSC, best supportive care; DMF, dimethyl fumarate; DMT, disease-modifying therapy; ICER, incremental cost-effectiveness ratio; IV, intravenous; NA, not applicable; QALYs, quality-adjusted life-years.

rate of 23.7% from year 5 onward, ofatumumab would be cost-effective versus cladribine. If the retreatment rate was increased to 36.6%, ofatumumab would dominate cladribine, that is, ofatumumab would be less costly and more effective compared with cladribine. When an alternative source for the EDSS state utilities was used, this had very little impact on the model results (Table S9). Similarly, the model results were still consistent with the base case at a lower discounting rate of 1.5% applied to both costs and outcomes (Table S10).

One-way sensitivity analysis. The top 11 parameters with the greatest influence on the NMB comparing ofatumumab with ocrelizumab were presented in a tornado diagram in descending order (Figure S1). The key determinants of NMB were the progression efficacies of ofatumumab and ocrelizumab. Varying the parameter values within defined ranges resulted in NMB values from AED −27,278 to AED 772,321.

Probabilistic sensitivity analysis. The results of the PSA are aligned with the base case (Table S11). The cost-effectiveness accessibility curve for the comparison versus ocrelizumab, another anti-CD20 monoclonal antibody, is shown in Figure S2.

Discussion

With the advent of treatment modalities for MS, it is imperative to assess the clinical and economic value of the existing treatments. To our knowledge, this is the first economic analysis developed for the UAE to assess the cost-effectiveness of ofatumumab versus other DMTs. Our analysis indicated that in all the performed comparisons, except for cladribine, ofatumumab was cost-effective and often dominant over a 65-year time

horizon as per the model assumptions. The model assumes that the baseline patient distribution across the EDSS states is based on the pooled data from ASCLEPIOS I and II trials.

The EDSS health state costs applied in the model were derived from expert interviews and validated by a panel of 12 local experts. The elicited responses have shown that the economic burden of patients with MS increases with increasing levels of disability, which is in line with other published studies.[34,35] Treatments that can slow down the rate of disease progression early can prolong the time spent in lower EDSS states, thereby reducing the costs of MS care. In a recent cost-consequence study conducted from the UK National Health Service perspective, early treatment with ofatumumab was predicted to reduce relapse events, slow down disability progression, and increase the time spent in lower EDSS health states compared with delayed ofatumumab (e.g., DMF for 3 years, then ofatumumab for 7 years), leading to lower costs of MS care.[19]

It is worth highlighting several strengths of this study. Firstly, this is the first economic evaluation of ofatumumab in the UAE using locally generated cost inputs. Secondly, we have used a formal Bayesian NMA, based on systematically identified clinical data, to inform the ARR and the HR for disease progression for the DMTs. Although the use of an NMA for the treatment efficacy of DMTs has several challenges, as previously highlighted,[36] indirect treatment comparisons (ITCs) still provide a valuable tool to compare treatments not otherwise compared in a head-to-head clinical trial. The use of published NMAs or ITCs is in line with the recommendations from a recent systematic review of economic evaluations in RMS.[2] Finally, our economic analysis has used the model structure and assumptions widely accepted by Health Technology Assessment bodies. However, the transition from RRMS to SPMS is not explicitly modeled, which differentiates our model from previous economic evaluations. The typical MS model structure,[37] models SPMS as a separate health state, assuming that patients who progress to SPMS discontinue treatment and are subject to SPMS EDSS transitions. In the current model, we assumed that patients with SPMS continue to be treated and are subject to the same natural history of EDSS transitions, which is consistent with the treatment approach in the UAE (except for the use of interferon-beta) in this population. This data was captured from ASCLEPIOS I and II trials,[11] which included the populations from 37 countries, including countries from the Middle East. The primary natural history data source, the British Columbia cohort, did not separately model RRMS and SPMS transitions; therefore, it is plausible to consider RRMS and SPMS together.

The results presented here are in alignment with the original model, which assessed the cost-effectiveness of ofatumumab versus other comparators in different geographic settings. The first published assessment was performed in a Canadian public health care system and showed ofatumumab to be dominant over teriflunomide, interferons, DMF, and ocrelizumab; and cost-effective versus glatiramer acetate and BSC.[18] In the published analysis conducted in Greece, ofatumumab was found to be dominant over ocrelizumab and fingolimod, while it was more cost-effective versus natalizumab IV, teriflunomide, interferon β-1a, glatiramer acetate, interferon β-1b, and DMF.[20]

The results of our cost-effectiveness model should be interpreted considering some limitations. First, given the lack of long-term data, the treatment effect in the model was based on clinical trial outcomes extrapolated over a lifetime horizon, necessitating some assumptions about the long-term efficacy, safety, and discontinuation rates, which pose some uncertainties.

Second, after discontinuation, the model did not consider switching to second-line treatment, hence providing no information on the optimal sequencing of DMTs for those with RMS. Since treatment switching often occurs in real-world clinical practice, evaluating the cost-effectiveness of treatment sequences in MS is of interest, as recommended in a recent review of health economics studies in MS.[38] A study from the Netherlands recently investigated the cost-effectiveness of 360 treatment sequences involving DMTs in patients with RRMS.[36] Since randomized controlled trials mostly include treatment-naïve patients, the study had to assume that the efficacy of DMTs was not dependent on their timing or place in the treatment sequence, highlighting the unavailability of data showing the varying response to treatment depending on the sequence.

Third, the comparison against cladribine was highly uncertain. The current model assumed all-cause discontinuation probabilities to transition patients from a current treatment line to the next line, an assumption that is inappropriate for cladribine, which is administered at two timepoints. Cladribine was assumed to retain its treatment effect for the lifetime of patients who completed the two courses of treatment. Our scenario analysis showed that at an annual cladribine retreatment rate of 23.7% or 36.6% from year 5 onward, ofatumumab would be either cost-effective or dominant to cladribine, respectively. However, given the lack of data on the frequency of retreatment with cladribine, any such comparisons are likely to be considered speculative.

Finally, using utility data from other countries poses some uncertainty regarding the transferability of these utilities,[2] and hence, the model would have benefited from being updated with the locally generated EDSS state utility values. The use of jurisdiction-specific utility values has been recommended in a recent review of the health economics facets of MS.[38] The local EQ-5D evaluation study is ongoing, which will facilitate the inclusion of local utility values in future UAE-specific economic evaluations. Also, the model structure and input parameters were validated by clinical and health economics experts in the UAE and further confirmed via OWSA. Other inputs such as clinical efficacy inputs and costs were captured from the clinical trial and other published sources. Since the data from clinical and health economics experts was not derived from paper/electronic medical records, the results should be interpreted with caution.

Conclusion

The cost-effectiveness model adds to the information available for coverage and reimbursement decision-making of RMS treatments in the UAE. From the payer's perspective, ofatumumab is a cost-effective and often a dominant treatment option compared with ocrelizumab, DMF, fingolimod, natalizumab IV, teriflunomide, glatiramer acetate, interferons, and BSC. The cost-effectiveness, combined with the favorable safety profile and simple route of administration, positions ofatumumab as a valuable treatment option for patients with RMS. Future economic evaluations to incorporate the switching patterns among DMTs are warranted.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Author contributions

Jihad Inshasi: Conceptualization; Data curation; Formal analysis; Investigation; Writing – original draft; Writing – review & editing.

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Data available within the main manuscript or Supplemental Material.

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