

Humanistic Burden of Adrenoleukodystrophy: A Systematic Review

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CONCLUSIONS

- Symptomatic ALD patients present with physical and psychological comorbidities significantly impacting their HRQoL, particularly physical disability •
- The findings highlight the necessity of developing advanced treatment options to enhance the HRQoL of ALD patients

INTRODUCTION

- peroxisomal ABCD1 gene, resulting from the abnormal metabolism of the very long chain fatty acids¹
- cerebral ALD that manifests either in children or more rarely in adults²
- contributing to poor health-related quality of life (HRQoL)³



OBJECTIVE

• The current systematic literature review (SLR) aimed to identify and summarize HRQoL outcomes in ALD

METHODS

- This review followed the standard methodology for conducting SLR as per guidelines provided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)⁴
- Key biomedical databases (EMBASE[®], MEDLINE[®]) were searched from database inception to June 2024 to identify relevant evidence published in English language reporting humanistic burden in ALD patients
- **Figure 1** presents the pre-specified eligibility criteria for this SLR

Included studies

(n=6 studies from 8 publications)

- The search terms included different combinations of ALD and HRQoL measures
- Each publication was reviewed by two independent reviewers with conflicts resolved by a third reviewer

Figure 1: Pre-defined PICOS eligibility criteria

ALD: Adrenoleukodystrophy; HRQoL: Health-related quality of life

RESULTS

- A total six studies of 123 screened publications were included (Figure 2)
- The sample size of ALD patients ranged from 46⁸ to 180⁹, while the mean age ranged from 42.3⁵ to 51.2⁹ years
- Figure 3 and Figure 4 depict the study and population characteristics, respectively

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Study design	Sample size	Region		20	
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SF-36: 36-Item Short For	m Survey; UK: Unite	d Kingdom; US: United States			

- The symptomatic and asymptomatic male ALD patients reported significantly different scores on four SF-36 domains (physical functioning: p<0.0005, vitality: p=0.025, social functioning: p=0.010 and physical component summary: p<0.0005⁸, while across another study, symptomatic women reported significantly decreased HRQoL on all subscales compared to asymptomatic women except for the mental health⁹ (Table 1)
- In another study, a trend towards statistically significant difference was reported on measures related to physical disability between symptomatic and asymptomatic patients¹⁰

Table 1: Comparison of symptomatic versus asymptomatic ALD patients on HRQoL

	Huffnagel 2019*			Schäfer 2023			
Domains	Symptomatic	Asymptomatic	p-value	Symptomatic	Asymptomatic	p-value	
Physical functioning	17.06	35.46	<0.0005	47.2	96.2	<0.001	
Role-physical	21.27	25.42	0.326	40.6	94.0	<0.001	
Bodily pain	21.16	25.69	0.284	51.8	86.7	<0.001	
General health	20.06	28.31	0.052	46.6	72.2	<0.001	
Vitality	19.69	29.19	0.025	42.9	57.5	<0.001	
Social functioning	19.26	30.23	0.010	64.4	87.5	<0.001	
Role-emotional	17.85	24.45	0.115	62.2	85.3	<0.001	
Mental health	20.94	26.23	0.212	61.2	70.0	<0.010	
Physical health component	18.03	33.15	<0.0005	35.3	55.3	<0.001	
Mental health component	22.68	22.08	0.887	45.7	47.5	NS	

- Majority of the studies reported HRQoL data using 36-Item Short Form Survey (SF-36) scale (n=4), followed by one study each using SF-Qualiveen and survey questionnaire
- Patients with ALD who experienced gait difficulties, urinary, and bowel symptoms reported a decline in their HRQoL⁵, with a significant correlation observed between postural body sway and various domains of the SF-36: physical functioning (p<0.001), general health (p=0.002), energy/fatigue (p=0.004), pain (p=0.007)⁶
- Moreover, bladder symptoms in ALD patients were associated with impaired HRQoL on SF-Qualiveen questionnaire, with higher mean scores reported for males compared to females (1.9 vs. 1.4; p=0.13)⁷

ALD: Adrenoleukodystropny; HRQoL: Health-related quality of life; NS: Not significant *Data depicted as mean rank

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Disclosures

AS, GK, and BS, the authors, declare that they have no conflict of interest

