Supplementary Table 1: Characteristics of Included Studies

Author (year)	Study design	Number of patients	Mean age or (age range) in years	Gender (n)	Lesion type	Location	Follow-up (months)	Complete response (CR) n (%)	Partial response (PR) n (%)	No response (NR) n (%)	Recurrence n (%)
1. Yu *et al*.[20] (2008)	Prospective study	36	51 (32-79)	Male (35) Female (1)	OVH	Buccal mucosa, labial mucosa, alveolar mucosa, and soft palate	Upto 35	36 (100)	0 (0)	0 (0)	0 (0)
2. Yu *et al*.[21] (2009)	Nonrandomized prospective study	46 LED-20 Laser-26	56 (34-89)	Male (44) Female (2)	OEL	Buccal mucosa, labial mucosa, alveolar mucosa, tongue, gingiva, palate, and floor of mouth	Upto 72	LED–17 (85) Laser–25 (96.15)	LED–3 (15) Laser–1 (3.85)	LED–0 (0) Laser –0 (0)	LED-5 (25) Laser-5(20)
3. Lin *et al*.[5] (2010)	Prospective study	80 (40 patients in OVH group and 40 patients in OEL group)	OVH group-50±6 (42-74) OEL group 58±12 (34-89)	OVH group Male (39)Female (1) OEL group Male (38)Female(2)	OVH and OEL	Buccal mucosa, labial mucosa, alveolar mucosa, tongue, palate, and floor of mouth	Up to 37	OVH–40 (100) OEL–38 (95)	OVH–0 (0) OEL–2 (5)	OVH–0 (0) OEL–0 (0)	OVH– 0 (0) OEL– 0 (0)
4. Jerjes *et al*.[37] (2011)*	Prospective study	147	53±8.9 (41-98)	Male (82) Female (65)	Oral epithelial dysplasia and carcinoma in situ	Floor of mouth, tongue, and retromolar area	87	119(81)	12 (8.2)	11 (7.5) – progressive disease 5(3.4) – stable disease	17 (11.6) patients had recurrence and 11 (7.5) patients had malignant transformation
5.Shafirstein *et al*.[27] (2011)	Nonrandomized, single-arm, single-site phase I/II pilot	23	62.2 (37-79)	In Phase I Male (4) Female (5) In	Leukoplakia with or without dysplasia	Buccal mucosa, tongue, bucco - gingival mucosa, floor of mouth, and retromolar	12 after treatment	Of 17 patients, 7 (41%) had more than 75% regression	Of 17 patients, 9 (53%) had more than 25% regression (partial response)	1 (6)	1 (4.35)

	study			Phase II Male (11) Female (6) Included in Phase II were the 3 patients from phase I who received the maximum tolerated dose		trigone		(significant response)			
6.Kawczyk-Krupka *et al.*[9] (2012)	Nonrandomized prospective study	85 PDT group (48) Cryotherapy group (37)	PDT group (32-75) Cryotherapy group (21-73)	PDT group Male (17) Female (20) Cryotherapy group Male (20) Female (28)	OL	Buccal mucosa, mandibular mucosa, maxillary mucosa,lips, floor of mouth, palate, tongue, andbucco-gingivalsulcus	PDT group-4-34 Cryotherapy group-2-127	PDT Group1--CR in 20 (67)PDT Group2 – CR in 15 (83)	PDT Group1–7 (14.58) PDT Group2-(2 (5.41) patients had partial responses in one site but no responses at other sites)	PDT Group 1-3 (6.25) (in 1 patient lesion in left buccal mucosa showed no response, lesion in lip showed partial response) PDT Group 2- 1 (2.70) patient had complete response in all sites but no response in one site)	PDT Group1-11(37) PDT Group2-2 (11)
7. Kvaal	Open	17 (2	Not	Male	OLP	Buccal	6-48		First week-	-	11

et al.[4] (2013)	nonrandomized noncomparative study	patients were excluded, 1 patient withdrew, 14 patients were evaluated)	mentioned	(9) Female (8)		mucosa			gradual improvement. At the end of 1 month treated side better than control side. After 6 months-improvement in both treated and control sides.		patients were followed up. 9(81.81) had improvement 2(18.18) – no change
8. Wong *et al*.[12] (2013)	Phase I study	11	66 (48-71)	Male (6) Female (5)	Oral leukoplakia	Tongue, floor of mouth, and gingiva	3 after treatment	0 (0)	0 (0)	11 (100)	1 (%) patient had delayed but durable complete clinical response but new lesion appeared on tongue (out of treatment field) after 1.25 years
9. Selvam *et al*.[6] (2015)	Prospective study	5	43 (35-49)	Male (5), Female (0)	Oral leukoplakia	Buccal mucosa, tongue, floor of mouth, and gingiva	12	2(40)	2(40)	1 (20)	0 (0)
10. Maloth *et al*.[10] (2016)	Prospective study	21	PDT Group OL-39.2±14.6 OLP-33.6±9.3 Conventional	Not mentioned	OL and OLP	Buccal mucosa, tongue, vestibule, and gingiva	1	In OL study subjects, out of 12 lesions - 2 (16.7)completely responded	In OL study subjects, out of 12 lesions, 8 (66.7) showed partial response. In OLP study subjects, of the 10	In OL study subjects, 2 (16.7) showed no response. In OLP study subjec	Not reported

			therapy OL-39.7±13.2 OLP-38±7.5						lesions, 8(80) showed partial response	ts, of the 10 lesions, 2 (20) showed no response	
11. Ahn *et al*.[13] (2016)	Phase I trial	35 (29 evaluable)	62	Male (10) Female (19)	High-grade dysplasia, carcinoma in situ, early-stage carcinomas of the head and neck	Tongue, floor of mouth, buccal mucosa, alveolar ridge, lip, larynx, and nasal cavity	3.2–59.4	69% CR at 3 months	-	-	10 (34%) patients developed local recurrence
12. Sulewska *et al* [8] (2017)	Case series	12	69.63±6.03 (63-80)	Male (0) Female (12)	OLP	Buccal mucosa, tongue,andg ingiva	12	Of the 22 lesions, 5 (22.73) had CR	Of the 22 lesions, 11 (50) had PR	Of the 22 lesions, 6 (22.27) had NR	Disease relapsed in 4 sites (buccal mucosa) after 12 months
13. Sulewska *et al*.[22] (2019)	Case series	50	26-84	Male (36) Female (14)	Reticular OLP	Buccal mucosa, labial mucosa, tongue, and gingiva	12	On completion of therapy, of the 124 lesions 46 (37.10) had CR. 12-month post therapy, 72 (58.06) had CR	On completion of therapy, of the 124 lesions 63 (50.81) had PR. 12-month post therapy, 43 (34.68) had PR	On completion of therapy, of the 124 lesions 15 (12.10) had NR. 12-month post therapy, 9 (7.26) lesions had NR	0 (0)
14. Han *et al*.[23	Prospective study	29	56.1±11	Male (11) Female	Oral leukoplakia	Buccal mucosa, tongue, and	3	Among the 25 respon	Among the 25 respondi	4 (16)	3 (12)

] (2019)				(18)		gingiva		ding patients, 16(64) experienced CR	ng patients, 9 (36) patients experienced PR		
15. Yao *et al*.[11] (2021)	Randomized controlled trial	48 (44 completed the study)	AFL-PDT group-59.9±10AFL group-58±9.4	AFL-PDT group Male (11) Female (12) AFL group- Male (12) Female (9)	OL	Buccal mucosa, tongue, and floor of mouth	11	In AFL-PDT group, out of 23, 18(78.3)	In AFL-PDT group, out of 23, 5 (21.7)had significant response	0 (0)	In AFL-PDT group, 4 (17.39) recurrences
16. Ou *et al*.[24] (2022)	Prospective study	71	18-75	Male (69) Female (2)	OL	Buccal mucosa, tongue, and floor of mouth	12	60 (84.51)	11(15.49)	0 (0)	9 (12.68)
17. Sulewska *et al*.[25] (2023)	Case series	20	58.38 ± 10.51 (40–76)	Male (7) Female (13)	OLP	Buccal mucosa, tongue, gingival, sublingual and lingua area	12	On completion of therapy, of the 40 lesions 14 (35) had CR.	On completion of therapy, of the 40 lesions 23(57.5) had PR	On completion of therapy, of the 40 lesions 3 (7.5) had NR	5 (12.5)

*results of ALA and mTHPC were not presented separately.

AFL = ablative fractional laser, ALA = aminolevulinic acid, CR = complete response, LED = light emitting diode, mTHPC = tetra (m-hydroxyphenyl) chlorine, n- number, NR- no response, OL = oral leukoplakia, OEL = oral erythroleukoplakia, OLP = oral lichen planus, OVH =. oral verrucous hyperplasia, PDT = photodynamic therapy, PR = partial response

Supplementary Table 2- Characteristics of Photosensitizer and PDT Protocol

Author	Type of ALA	Administration method	Light source	Wavelength (nm)	Energy density (J/cm^2)	Duration of irradiation	Frequency of PDT
1. Yu *et al.*[20] (2008)	20% ALA gel	Topical application of 20% 5-ALA for 1.5 hours before light treatment	LED	635±5	100	Five 3-min and one 100-s irradiations separated by five 3-min rests for a total of 1000seconds	Once a week
2. Yu *et al.*[21] (2009)	20% ALA gel	Topical application of 20% 5-ALA for 1.5 hours before light treatment	Group 1- LED Group 2- Laser	LED- 635±5 Laser- 635	100	Five 3-minute and one 100-second irradiations separated by five 3-minute rests for a total of 1000seconds	Once a week
3. Lin *et al.*[5] (2010)	20% ALA gel	Topical application of 20% ALA 1.5–2hours before light treatment	Laser	635	100	Five 3-minute and one 100-second irradiations separated by five 3-minute rests for a total of 1000seconds	Once a week
4. Jerjes*et al.*[37] (2011)*	60 mg/kg 5-ALA cream (for thin mild-moderate dysplasia)	Topical application 3 - 4 hours prior to illumination	Diode laser	628	100 and 200	Not mentioned	Not mentioned
5.Shafirstein *et al.*[27] (2011)	20% ALA solution	Topical application 1.5 hours before illumination (In case of difficulty in application due to salivary dilution, intralesional injection was used)	Pulsed dye laser	585	8	pulses of 1.5 milisecond (at an interval of 1-3 sececonds)	Not mentioned
6.Kawczyk-Krupka *et al.*[9] (2012)	20% ALA emulsion	PDT Group1- topical application of	Group1- Semiconducto	PDT Group1-630	100	900seconds	2-12 sessions (2 weeks

		20% ALA 2hours before light treatment PDT Group2- topical application of 10% ALA for 2hours before light treatment	r laser Group2- Argon pumped dye laser	PDT Group2-635			interval)
7. Kvaal*et al.*[4] (2013)	Methyl 5-aminolevulinate cream	Topical application 3hours before light treatment	LED	600-660	75	-	1
8. Wong *et al.*[12] (2013)	30 mg/kg ALA powder dissolved in 50mL water	Oral administration 3 -4hours before light treatment	Long pulsed dye laser	585	2 - 8	-	-
9. Selvam *et al.*[6] (2015)	10% ALA emulsion	Topical application 3hours before light treatment	Xenon lamp	630±5	100	Five 3-minute and one 100-second irradiations separated by five 3-minute rests for a total of 1000seconds	6–8 sessions
10. Maloth *et al.*[10] (2016)	98% ALA solution	Topical application 30 minutes before light treatment	LED	420	-	10 minute with 3 minute fractionization	Several session
11. Ahn *et al.*[13] (2016)	60 mg/kg ALA	Oral administration 4 - 6 hours prior to light treatment	Diode laser	629 - 635	50 - 200	Unfractionated continuous irradiation or fractionated irradiation with 90–180seconds break to full fluence	-
12. Sulewska *et al* [8] (2017)	5% ALA gel	Topical application 2 hours before light treatment	LED	630	150	500seconds	10 weekly
13. Sulewska *et al.*[22] (2019)	5% ALA gel	Topical application 2 hours before light treatment	LED	630	150	-	10 weekly

14. Han *et al*.[23] (2019)	20% ALA gel	Topical application 2 hours before light treatment	Laser	632	90 - 180	3 minute with 1 minute intervals	-
15. Yao *et al*.[11] (2021)	20% ALA gel	Topical application 3 hours before light treatment	Laser	630	180	5 minute	Each treatment zone underwent 1 session
16. Ou *et al*.[24] (2022)	20% ALA gel	Topical application 3 hours before light treatment	LED	635	120	25 minute	-
17. Sulewska *et al*.[25] (2023)	5% ALA gel	Topical application 2 hours before light treatment	LED	630	120	-	10 weekly
ALA =aminolevulinic acid, LED = light emitting diode, PDT = photodynamic therapy							