
Treatment of Melasma with Topical Agents, Peels and Lasers: An Evidence-Based Review

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Abstract

Background: Melasma is a common skin condition characterized by brown, gray, or black patches on the face. It is caused by an overproduction of melanin. The condition is more common in women and is often associated with hormonal changes, such as those that occur during pregnancy or with the use of oral contraceptives. The condition is also associated with sun exposure and certain medications. The treatment of melasma is challenging, and there is no single, definitive treatment. However, a combination of topical agents, peels, and lasers can be used to improve the appearance of the skin. This review will discuss the evidence for the use of these treatments in the management of melasma.

Objective: The objective of this review is to provide an evidence-based overview of the treatment of melasma with topical agents, peels, and lasers. The review will discuss the efficacy, safety, and side effects of these treatments, as well as the role of each in the overall management of the condition.

Methods: A systematic search of the literature was conducted using the following keywords: melasma, topical agents, peels, and lasers. The search was limited to English-language articles published between 2000 and 2013. The articles were screened for relevance, and the full text of the most relevant articles was obtained. The data from these articles were then analyzed and synthesized to provide an evidence-based overview of the treatment of melasma.

Results: The results of the search and analysis are presented in the following sections. The first section discusses the use of topical agents in the treatment of melasma. The second section discusses the use of peels, and the third section discusses the use of lasers. The final section provides a summary of the findings and recommendations for the treatment of melasma.

Conclusion: The treatment of melasma is a complex task, and there is no single, definitive treatment. However, a combination of topical agents, peels, and lasers can be used to improve the appearance of the skin. This review provides an evidence-based overview of the treatment of melasma, and it is hoped that it will be helpful to clinicians and patients alike.

$$m_r \dots r \dots m \dots f \dots z'z' \dots z$$

Table 1

	r	g	r	m	f	m (g)	mm	g
2003 14	m	-	m	fr 8 m	29	m r f, g m 4.60 2.78	f g gr	g
	-	-	12	g g m		m, f, g r g		
	r	-	fr 8	fr 12		L, f m 4.45 3.87	r g	
	g f	-	fr 12	g, gr				
2004 18	m	-	5 % g	fr	26	r g 18.5 %	r g ff gr	r
	-	-	12 g g	g, gr		g g 13.5 %		
	-	-	fr 12	r, g, g		gr, ff r, g m gr m		
	-	-	60 g gr			ffr		
	g f	-				6.9 %		
2006 17	m	-	g m	g r m g r	27	g g 1.03 %	m g, r g m	g fr g
	-	-	3 m g	fr		m m r, f m r, g	m g, r g m	g fr g
	-	-				r, r, r m r, g	g fr m g m r f r g	
	r	-				g g g m	g). r g ff gr	r
	m	-	g 1 r	gr m 0.3 % g	28 m	r, g m gr, r m	m r g g g g g	
2007 15	-	-	12 g	f	g 1	r g g g, r	r m g g g	g
	-	-	g 2 g	gr	26 m	g 2 m	g, r g	(78 %) g
	r	-	3 m g ff, f	r, r m		g, r, m r, g r, -	r	
	g f	-	g g m g 16, 20, 24	g	g 2	r g, r m r, r	r g ff gr	r
		-	60 g gr	g, r		g g, m r	g	r
2010 16	m	-	g m	g 4 - r gr	23	r, r m	r g ff gr	r
	-	-	L 0.1 % r	g ff		4 - r gr r g	r m 60 % f r g g r	
	-	-	ff	fr 8		m r	r m f, g fr 8 g	
2011 26	g f	-						
	m	-	75 % m	r	50	g r g m m r g r g	r g ff gr m m	m
	g	-	g	g g g 4		m r g 8 g f m g m r	r, g gr f r g g	
	-	-	8 g			m, r r r, r g r	75 % m, r m m (4) g	
	r	-				g g g	r g r g	

r m f s^m , , s, s, s^r s^r

m s^m , ff s^r r s^r s^r . -

12- 15 s^r , f fr, m r s^r s^m .

f, m , s^m s^r , m s^r s^r ,

s^r , s^r , r s^r , m , r m r

s^r s^r , r s^r , r m m s^r m

r , r s^r s^r , r m m s^r m

ff r m , s^r s^r 16

s^r f r , f s^r f f -

s^m - s^r 4- , r s^r 0.1 % r m

f, m m r m s^r m s^r f r 8 s^r , m r

mm r , s^r s^r m r , s^r f r

r m r f m s^m r m r s^r f r -

s^r , r m s^r f s^r f s^r s^r

s^r , r m s^r , f r m s^r

f r m , r s^r s^r , r r s^r s^r

m , , m , -

m s^r m , r m 17 m r m s^r

f r m s^r m f r 3 m s^r

f r f, m m s^r ff r

r , s^r s^r , m m r , r r , r ,

r s^r s^m , r m m , s^r s^r m r s^r

s^r s^m , m r s^r r s^r f s^r

s^r m r mm r f r m s^m .

s^r s^r , r m f m s^m s^r 5 %

12- , s^r f s^r , r s^r -

18 f s^r s^r s^r ff r , s^r -

m r m m m s^r f , 6.9 %

(L* ,)

r s^r m r 1.03 % r

s^r s^r , ff r s^r s^r s^r s^r

r , s^r r s^r ff s^r r r r .

4.2.2 Reti id The a^{je}

r m s^r , s^r s^m r f r m -

s^m r m f s^r s^r m s^m

r s^r r , r m s^r r s^r , m s^m

19, 20 .

m r s^r f 0.1 % r m

40- s^r , f s^r m

m s^m , r f s^r . 21 s^r 68 % f r -

m s^m m r , 5 % r ,

r , f 24 s^r s^r r r f r s^r , m r

m r s^r , m r

(88 %) f r s^r r , r s^r ff s^r s^r s^r

r m s^r s^m s^r m r s^r , s^r ,

r r - r 22 s^r , s^r ,

f f r f r s^r m s^r s^r s^r

s^r , m s^r r s^r m f

m s^m r , r s^r r s^r

32 % r s^r s^r 10 % r s^r r ,

s^r s^r , r f s^r m 21 , s^r

24 s^r f r m r s^r , s^r f r

s^r s^r m r s^r , s^r f r

s^r s^m .

23 s^r , s^r f 0.05 % m -

s^r L , r s^r s^r s^r s^r s^r ,

s^m f , r s^r s^r m s^r s^r

ff r s^r s^r r m r m s^r

r , s^r f r 40 s^r r s^r r m s^r

s^r s^r r - r f s^r s^r -

r , r ,

4.2.3 Othe T^{ica} The a^{je}

r m s^r m s^m s^r s^r s^r

r m f r m s^m , s^r f r s^r

s^r , r s^r s^r s^r f r ,

r . 24 s^r , m ff r s^r

f , f r m r , s^r

m r ,

s^m s^m , r s^r s^r s^r

s^r m r s^r s^r s^r s^r 12 s^r

m r s^r , s^r m

r , s^r f s^r s^r s^r , m

f f s^r , r s^r r r , r r

r m s^r m r s^r r

r m s^r m r s^r ff s^r

r s^r .

f L , m 25 s^r , s^r

r m f m s^m s^r , m

f 2 % m 2 % m

0.05 % s^r , f ,

f r 6 s^m r , s^r f m r

r , s^r s^r

r r s^r 31.1 % , m r 2 %

m r m 14.6 % r r

m s^r , r s^r s^r s^r

f m s^r , ff s^r r L ,

r s^r s^r r s^r m r m r 23 .

[illegible]

4.2.4 *C. bi-ati* *C. ea*

Table 4

[illegible]

Table 4

Year	Area (ha)	Production (kg)	Yield (kg/ha)	Quality (mm)
2011	1.064	16		
2012	1.550	18		
2013	1.550	18		
2014	1.550	18		
2015	1.550	18		
2016	1.550	18		
2017	1.550	18		
2018	1.550	18		
2019	1.550	18		
2020	1.550	18		
2021	1.550	18		
2022	1.550	18		
2023	1.550	18		
2024	1.550	18		
2025	1.550	18		
2026	1.550	18		
2027	1.550	18		
2028	1.550	18		
2029	1.550	18		
2030	1.550	18		

(4).

4.4.1 Interfered Light

40
 4 %
 39.8 %
 11.6 %
 35 %
 14 %
 24.2 %
 10-
 41
 4 %
 0.01 %
 10, 57 %
 23 %
 42
 49.4 %
 44.9 %
 12 m
 6 m
 7-
 2

4.4.2 Q-S itched Ne d i -D red Ytt i A i
Ga et (QS-Nd:YAG) La e

43
 1,064 m
 2 %
 92.5 %
 19.7 %
 75.9 %
 24 %
 44
 1,064 m
 30 %
 32.6 %
 22 %
 37.4 %
 16.7 %
 45
 2-
 2-
 12-
 mm
 m

4.4.3 *P ed-D e La e*

, 3 - 3r () 3 3r r m r , 3
 3 r m Lf m 3 m r 3 ,
 r m 3 , r , r m 3 m r 3 f
 3 , 18 , 3 m , 3 , r m f
 r , f r 4 m 3 , 33r , 3 46
 3 m 3 3L 3 , r 3 3 r
 m 3 , m 3 3 3 ,
 r 3 2- m f - 3 . 3 - mm r
 r , m 3 3 3r r 3 ,
 f m r 3 (r 3 m).
 3 m m 3 m f , r r 3
 m 3 , 3 mm r r 3 f
 3 , 3 r .

4.4.4 *F acç i a Ph t the i*

r m , 3 f 3 , , 47 3 ,
 r m f f 3 , 3 33 f f
 r m 33 - f f f m r
 5 % r r m m m 3 r f r
 f f f f r m 3 , r 3 m f ,
 ff , 3 r r 4
 3 r , 3 3 , ff r
 r , 3 r 3 r r

3 , 3 , 3 3 m
 3, r r 3 r m m 3 ff
 3 f f r m f m 3 m, r 3 -
 r f r m 3 3 r r r
 m r f r) . r r (r
 m r f r m 3 m 3 m f -
 3 m f m 3 3 3 f
 f m f m 3 3 r r 3
 m r m f m 3 3 3
 m 3 3 r r 3 r
 r 3 3, m r 3 r 3 f rr
 3 3 r m 3 3 m 3 3
 - r m r f r m 3 m 3, 3 3
 r r r 3 m f m 3 m
 f r m f m r
 ff r 3 f, r

Acknowledgments

Acknowledgments

References

- [illegible]

12. r f m , f r m , ff m f 20%
m r m . 4% r r f m
m r m . 2011 10 282 7.
13. f - r m L r m f 5% f r f . 4% r m
m . 2004 43(8) 604 7.
14. m , r , L r r f m
m r f m . 2003 206 316 20.
15. m f f , f f fr , m L f
m m r m r r r m . 2007
156 997 1004.
16. , , , f m f f m
m m 4- m r 0.1% r m f r m f
m r r f r m .
2010 37 311 5.
17. r m L m r r m , r r m , ff f
r f , m f m . m . 2006 28 263 7.
18. r f - , r f - m , r , r -
f r f m m r (, 5% f ,)
r m f m . 2004
13 18 23.
19. r r f , m f r r f . r m
m . 2006 19 280 8.
20. m r , r m , L r m , r f
m r f m , m f r
1994 107 1095 103.
21. r f f , L r , m
r f r L () m m f m
m r r r m . 1993
129 415 21.
22. m r r - , r f f , m
(r) f r m f L r m
1994 130 727 33.
23. L f r m , m , f f
r f r . 1999 82 868 74.
24. r m , m f m f m f m f
5% r m r m f m f m f
r . 2012 14 150 4.
25. L , m , m , m r , ff f f
r m f m f . r . 2002 17 518 23.
26. , m , r r , m r m
f f f f f 75% m rr (m f m)
r m r f r r r r r
m . 2011 10 1025 31.
27. m r m f m f m r m
r . 2012 12 18.
28. r , r f , f , f
f m f f m L - m f r
r f f f f . 2003 72(1) 67 72.
29. m r r L r L f f f f
r m (, 0.01%, r m
4%, r 0.05%) m r 4% r m
f f m r f m r m .
2008 159 697 703.

30. $\frac{r}{m} \cdot \frac{m}{z} r$, $\frac{z}{r} m$, $\frac{m}{-m}$, r , m^r
 $\frac{ff}{z} r$, r , m , r , $\frac{z}{r} m$, m , $\frac{z}{r}$, r , $\frac{z}{r}$,
 $\frac{z}{r}$, r , r , m , r . 2012 26(5) 611 8.