Pre-operative Topical Benzoyl Peroxide Treatment is Effective in Reducing Cutibacterium Acnes in Shoulder Surgery: Systematic Review

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Disclosures

- No financial conflicts to disclose for any of the authors.

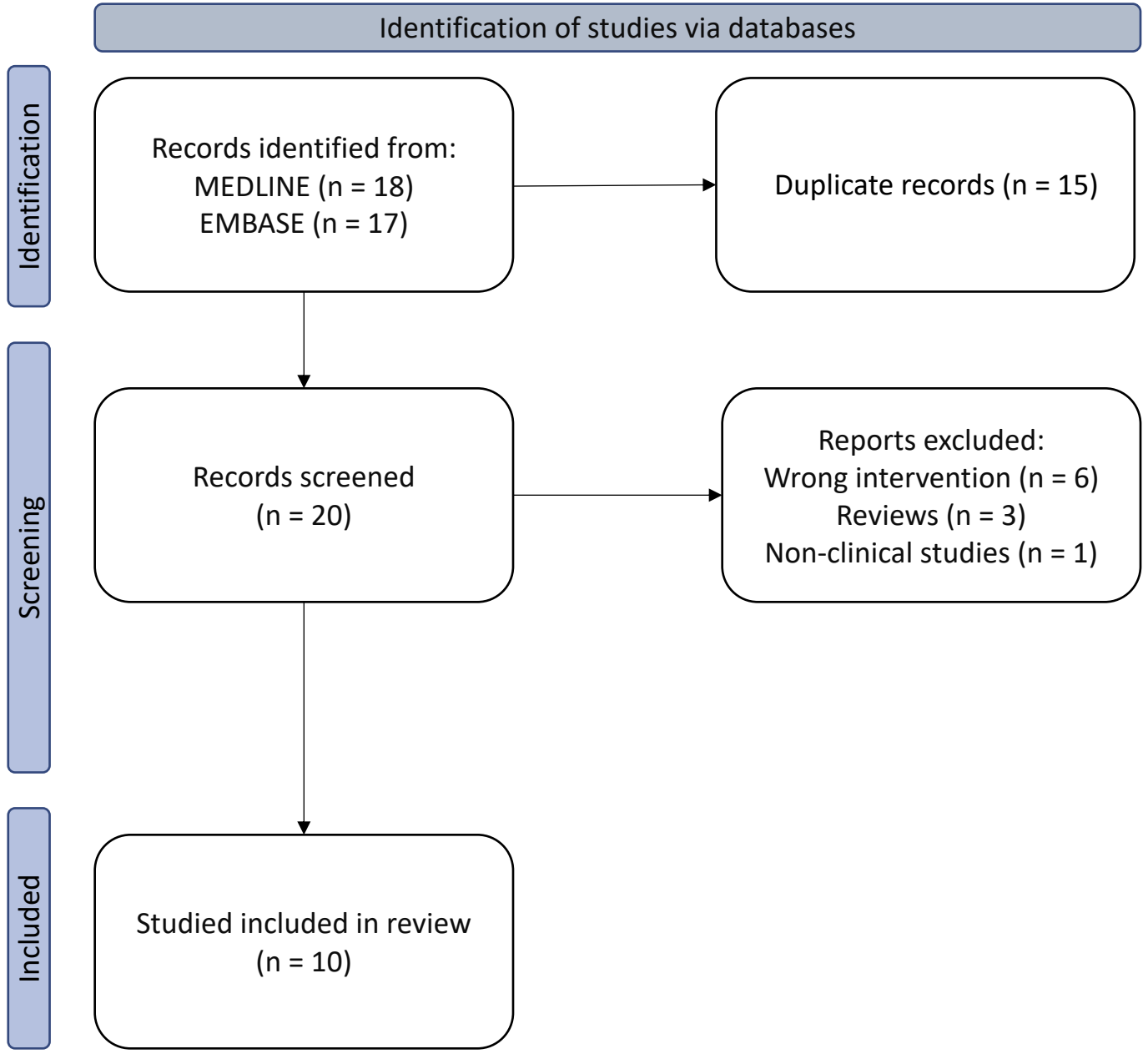
Background

- Cutibacterium acnes
  - Dermal
  - Incision = release
  - Deep SSI
  - Resistant
- Benzoyl peroxide (BPO)
  - Dermatology
  - Penetrate deeper
  - Few side effects
  - Topical

Aim = Is pre-operative topical BPO treatment effective at reducing *C acnes* colonisation and/or deep SSI in shoulder surgery?

Methods

- PRISMA guidelines
- Oct + Dec 21
- Eligibility
  - Primary + clinical
  - English
  - Adult patients/volunteers
  - Topical BPO
  - Microbiology sampling
- MINORS tool + CONSORT checklist



Results

- **6 RCTs**
- 2 prospective cohort
- 2 case series

- Study population = 482
  - BPO = 328
  - 63% males

- 50% patients
- 50% volunteers

- Topical BPO
  - All studies
  - Varying regime

- Comparator
  - 7/10 studies
    - Soap/CHG/placebo

- Superficial sampling
  - 9/10 studies
- Deep sampling
  - 5/10 studies
- Deep SSI
  - 4/10 studies

Study	Outcome	Superficial sampling								Deep sampling						Deep SSI		**Conclusion**
		Pre-topical treatment		Pre-skin prep in theatre		Post-skin prep in theatre		Post-procedure		Dermis swab		Punch biopsy		Joint aspiration				
		BPO	Comp	BPO	Comp	BPO	Comp	BPO	Comp	BPO	Comp	BPO	Comp	BPO	Comp	BPO	Comp	
Scheer et al 2021	Viable count (CFU/ml) Positive swab/n			20	2250	0	0	50	1300	11/45	17/55	6/45	17/55			1/45	2/55	Reduction in C acnes with BPO ($p < 0.05$)
Hsu et al 2020	SpCuV			1.5 ± 1.4	1.6 ± 1.1					0.8 ± 1.4	0.8 ± 1.0							No significant difference
Heckmann et al 2019	Positive swab/n											1/12	4/12					No significant difference
Scheer et al 2018	Positive CFU/n	19/20	19/20	13/20	16/20	1/20	7/20	4/20	11/20									Reduction in C acnes with BPO ($p < 0.05$)
Kolakowski et al 2018	CFU (log reduction)			A 0.45 P 0.92 L 0.86 Ax -0.07	A -0.22 P 0.22 L 0.29 Ax -0.07											0/41	0/39	Reduction in C acnes with BPO ($p < 0.05$)
Hancock et al 2018	Positive CFU/n	D 22/22 Ax 21/22	D 22/22 Ax 22/22	D 5/22 Ax 4/22	D 4/22 Ax 2/22													No significant difference
Dizay et al 2017	Positive swab/n	31/65		12/65						2/65						0/65		Reduction in C acnes with BPO ($p < 0.05$)
Sabetta et al 2015	Positive swab/n			D 8/50 Ax 4/50		D 3/50 Ax 3/50		D 5/50 Ax 5/50				3/50		2/50		0/50		Reduction in C acnes with BPO ($p = 0.4$)
Van Diek et al 2020	Positive swab/n	15/15	14/14	3/15	4/15													Reduction in C acnes with BPO ($p = 0.009$)
Duvall et al 2019	CFU (log reduction			A -0.44 P -0.63 L -0.64 Ax -0.4														Reduction in C acnes with BPO ($p < 0.05$)

BPO = benzoyl peroxide; Comp = comparator; A = anterior portal; P = posterior portal; L = Lateral portal; Ax = axilla; D = deltoid

Results

- 7/10 studies reduction of C acnes with topical BPO
  - 6/10 studies statistically significant
    - 3 x level I and 2 x level II

Discussion

- Frequency + no. applications
  - Dizay et al
- Operative timeline
  - Rebound effect
- Superficial v deep effect
  - No significant difference
- Clinical infection
  - Three patients
- Male patients
  - Five-fold initial load
- Adverse effects
  - Dermal symptoms

Limitations

- Heterogeneity
  - No direct comparison
  - No pooling
- Clinical infection
  - Not 6/10 studies
- Cutibacterium family
  - C avidum, C granulosum

Conclusion

- Topical BPO = **significant** reduction in C acnes colonisation

- Clinical infection
  - No significant difference

- Further study
  - Application
  - Longevity
  - Gender

References

- For full references please download:

- Green N, Jordan RW, Maclean S, D'Alessandro P, MacDonald PB, Malik SS. Preoperative topical benzoyl peroxide treatment is effective in reducing Cutibacterium acnes in shoulder surgery: a systematic review. J Shoulder Elbow Surg. 2023 Jan;32(1):213-222. doi: 10.1016/j.jse.2022.07.019. Epub 2022 Sep 5. PMID: 36067940.