Autologous skin cell suspensions in partial thickness burn injury management: A Systematic Review

Anjana Bairagi[1,2,3], Bronwyn Griffin[1,2,3], Steven M McPhail[4,5], Roy Kimble[1,2,3,6], Zephanie Tyack[1,4,5]

[1] Centre for Children's Burns and Trauma Research, [2] Pegg Leditschke Children's Burns Centre, [3] School of Nursing & Institute of Health and Biomedical Innovation (IHBI), Queensland University of Technology, [4] School of Public Health and Social Work & Institute of Health and Biomedical Innovation, Queensland University of Technology, [5] Centre for Functioning and Health Research, Metro South Health, [6] Faculty of Medicine, University of Queensland

Introduction:

Acute partial thickness burns are commonly of **mixed depth** and continue to be a challenge to manage due to the potential for unacceptable scar outcomes. Over the last forty years, **autologous skin cell suspensions (ASCS)** have advanced from humble beginnings of serial keratinocyte cultures to the variety of formulations available today. The aim of this systematic review was to evaluate the **efficacy of non-cultured ASCS** on partial thickness burn and split thickness donor site wound management.

Method:

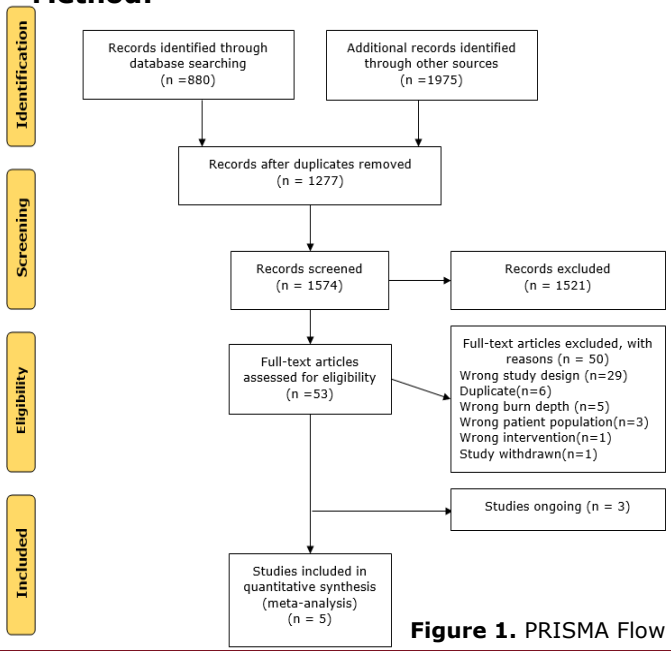

Figure 1. PRISMA Flow diagram

Results:

Table 1. Characteristics of included studies

First Author Year	Country	Study Design	Intervention	Sample Size	Age Mean (SD) years	Gender n(%)	Skin type/ Ethnicity (%)	Burn/donor site wound depth (mm)	B-TBSA Mean(SD) cm²	Donor site area Mean(SD) cm²
Gravante 2007	Italy	Within-subject RT	ASCS vs SOC	100	ASCS: 49 ± 9 SOC: 53 ± 10	M:50 (61) F:32 (39)	Not stated	BW: DPT DSW: 0.2 – 0.3	ASCS: 186 ± 96 SOC: 180 ± 100	ASCS: 2.2 ± 1 SOC: 110 ± 50
Holmes 2018	USA	Within-subject RT	ASCS vs SOC	133	39.5 ± 13.1	M: 85 (84.2) F:16 (15.8)	White (4.2) Black (19.8) Hispanic (18.8)	BW: DPT DSW: 0.15 – 0.2	ASCS: 168.2 ± 68 SOC: 165 ± 66.5	ASCS : 4.7 ± 3.2 SOC: 194.1 ± 158.5
Wood 2012	Australia	Parallel Pilot RT	ASCS/Biobrane vs Biobrane vs SOC	15	Median 2.1 (IQR 1.25 – 6.9)	M:6 (46) F:7 (54)	Caucasian (62) Australian Aboriginal (15) Asian (23)	Not stated	Median 4% (IQR 3.5% – 8%)	Not stated
Guerid 2013	Switzerland	Parallel RT	ASCS/Platelet vs Platelet vs SOC	45	ASCS/Platelet: 42.5 ± 12 Platelet: 45.5 ± 15.1 SOC: 46.9 ± 20.5	M:25(56) F:20(44)	Not stated	DSW: 0.2	N/A	180 Range(25 - 200)
Hu 2017	China	Parallel RT	ASCS vs SOC	106	ASCS: 51.3 ± 18.1 SOC: 47.8 ± 16.7	M: 76(72) F: 30(28)	Chinese (100)	DSW: 0.25	N/A	ASCS: 60.5 ± 32.2 SOC: 56.9 ± 28.4

KEY: SD Standard deviation; n number; B-TBSA Burn total body surface area; RT Randomised trial; ASCS Autologous skin cell suspensions; SOC Standard of Care; F Female ; M Male; BW Burn Wound; DSW Donor site wound; DPT Deep partial thickness; IQR Interquartile range; N/A Not applicable

Conclusion:

ASCS have been used **predominantly in adult populations**. The dearth of studies regarding the management of paediatric partial thickness injuries with ASCS justifies further research in this population.

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Contact: Dr Anjana Bairagi @anjana.bairagi bairagi@qut.edu.au

'The role of **ASCS** in the management of partial thickness burns in **children** remains **undefined**.'

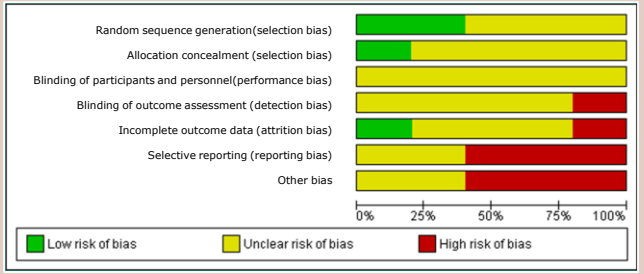

Figure 2. Risk of bias graph