

# LEUKOCYTE AND PLATELET-RICH FIBRIN (LPRF) THERAPY & LEPROSY: THE NEED FOR CAUTION AND RESEARCH AMONG MARGINALISED GROUPS IN LOW RESOURCE SETTINGS

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## Abstract

*This paper discusses the potential of Leukocyte and Platelet-Rich Fibrin Therapy (LPRF) to help treat ulcers and skin damage associated with leprosy. It warns that although LPRF may be a valuable and cost-effective treatment, it is crucial to understand potential resistance to haematologically based treatments. For physicians and health service staff operating within a biomedical paradigm, folk beliefs resisting such treatments may be inconsequential. However, research and education among marginalised and excluded populations is vital to overcome potential hesitancy and resistance to such treatments.*

**Keywords: LPRF; Leukocyte and Platelet-Rich Fibrin Therapy; Leprosy; Nepal; Resistance**

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Although there has been significant terminological confusion in the field [1], there is a growing evidence base to support the efficacy of Leukocyte and Platelet-Rich Fibrin (LPRF) in wound healing [2-4]. This therapy is relatively new, but has been used extensively in recent years in dental and oral and maxillofacial surgical settings [5]. LPRF has also been found to be effective across a range of other ailments [6-7], including the treatment of both diabetic foot ulcers [8] and chronic venous leg ulcers [9]. Given LPRF’s reported success in relation to ulcers, it is perhaps no surprise that it is also currently being trialled in people with leprosy [10-11].

Compared with many treatments LPRF

has the advantages of being economical, easy to prepare, and feasible for use in routine non-hospital clinical practices [4]. It is widely anticipated that because of its low cost and ease of use LPRF use will continue to expand rapidly into the future [12].

In many Western countries the marketing of LPRF to patients appears relatively straightforward. One US based dental practice describes LPRF as “basically a bioactive ‘band-aid’ that is created from your own blood and then placed in your surgery sites to promote healing” [13]. Table One details some of the routine positive health related aspects of LPRF used in marketing materials from another US based dental practice [14].

Table 1: Sample LPRF Health Marketing Material Claims [14]

<p>Only requires a small blood sample</p> <p>Virtually Painless</p> <p>100% natural, 100% you</p> <p>Biocompatible</p> <p>No additives, chemicals, or foreign substances</p> <p>L-PRF is individually made for you — from you</p> <p>Latest healing technology</p> <p>Improved healing response</p>	<p>Lower Risk for complications</p> <p>Healing properties</p> <p>Promotes Recovery</p> <p>Simple Holistic Procedure</p> <p>FDA cleared</p> <p>Reduced risk of allergy or side effects</p> <p>Significantly less recovery time</p>
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Given the obvious appeal of such marketing it may be easy to overlook patient resistance to LPRF therapy. One of the main religious groups best known for their general refusal of blood donations and many blood based products are Jehovah’s Witnesses [15-16]. Although there can be individual variation in attitudes and behaviour that may contrast with a religion’s strict doctrinal stances, fresh autologous blood based treatments, such as LPRF, have been identified as acceptable to this religious group [17]. This additional endorsement from this

group may to serve to further diminish any concern over patient resistance in some quarters.

However, it is always important to understand patient perspectives and remember that although increasingly mainstream, the prevailing Western biomedical paradigm is not dominant everywhere. Despite both national [18], and international [19] media acclaim around the potential benefits of LPRF it would be naïve to assume universal understanding or acceptance. Medical anthropologists and allied disci-

plines such as health psychology and the sociologies of health have a long tradition of exploring what are often termed such 'folk beliefs' in depth.

In many clinical settings health professionals are very familiar with a modest proportion of the population having a fear of needles or a fear of blood, and the possibility of fainting around blood [20-25]. However, for many a statement such as the following from a US dental practice website may effectively assuage concerns: 'The procedure to obtain L-PRF is virtually painless – no more so than a routine blood test' [13]. However, an acceptance of such reassurances is far from universal. As well as the actual impact of seeing blood taken for procedures such as LPRF, many cultures place a special emphasis on blood and its symbolic cultural meaning [26-31].

A reluctance to embrace Western biomedical haematological processes may be particularly acute in marginalised and illiterate populations, with extremely poor occupational, social and economic status. One example of such groups that may now potentially encounter procedures such as LPRF are patients with leprosy [10,32,33]. This disease is inequitably distributed across populations, with it routinely being more common amongst the poorest and most excluded ethnic and cultural groups. In Nepal for example the majority of the population with leprosy are Dalit, formerly known as the Untouchables. The Dalit population are a highly stigmatised and excluded group [34-38]. Anecdotal concerns around interventions such as LPRF are already emerging among some members of this highly marginalised population. Reluctance, hesitation and refusal among such marginalised groups must not be ignored or brushed aside.

High quality research is required to explore the evidence base for LPRF as an in-

tervention among patients with leprosy. However, research is also required to examine fears, attitudes, beliefs and lay understandings around this form of haematologically based treatment. Finally it is also essential to explore and develop community based education programs to encourage acceptance and utilisation of such potentially crucial therapeutic interventions. The involvement of marginalised communities in developing such resources, as well their involvement in peer education, is vital. Such resources and ways of working are important for two reasons. Firstly, because of both the relative low cost and ease with which such interventions can be used in relatively rural and remote settings. Secondly, because despite the WHO's misguided millennium designation of it having been eliminated [39,40], the incidence of leprosy in countries such as Nepal is increasing [41].

### Resumo

*Ĉi tiu artikolo diskutas la potencialon de Leŭkocitoj- kaj Trombocitoj-Riĉa Fibrinoterapio (LPRF) por helpi trakti ulcerojn kaj haŭtajn damaĝojn asociitajn kun lepro. Ĝi avertas, ke kvankam LPRF povas esti valora kaj kostefika traktado, estas grave kompreni eblan reziston al hematologie bazitaj traktadoj. Por kuracistoj kaj sanservopersonaro funkciantaj ene de biomedicina paradigmo, popolkredo rezistantaj tiajn traktadojn povas esti malgravaĵoj. Tamen, esplorado kaj edukado inter marĝeniĝintaj kaj ekskluditaj populacioj estas esencaj por venki eblan hezitemon kaj reziston al tiaj traktadoj.*

### References

1. Dohan Ehrenfest DM, Andia I, Zumstein MA, Zhang CQ, Pinto NR, Bielecki T. Classification of platelet concentrates (Platelet-Rich Plasma-PRP, Platelet-Rich Fibrin-PRF) for topical and infiltrative use in orthopedic and sports medicine: current consensus, clinical implications and perspectives. *Muscles Ligaments Tendons J.* 2014; 4(1):3-9.

2. Castro AB, Meschi N, Temmerman A, et al. Regenerative potential of leucocyte- and platelet-rich fibrin. Part A: intra-bony defects, furcation defects and periodontal plastic surgery. A systematic review and meta-analysis. *J Clin Periodontol.* 2017; 44(1):67-82. doi:10.1111/jcpe.12643
3. Al-Maawi S, Becker K, Schwarz F, Sader R, Ghanaati S. Efficacy of platelet-rich fibrin in promoting the healing of extraction sockets: a systematic review. *Int J Implant Dent.* 2021; 7(1):117. doi:10.1186/s40729-021-00393-0
4. Arshad S, Tehreem F, Rehab Khan M, Ahmed F, Marya A, Karoari MI. Platelet-Rich Fibrin Used in Regenerative Endodontics and Dentistry: Current Uses, Limitations, and Future Recommendations for Application. *Int J Dent.* 2021; 4514598. doi:10.1155/2021/4514598
5. Caruana A, Savina D, Macedo JP, Soares SC. From Platelet-Rich Plasma to Advanced Platelet-Rich Fibrin: Biological Achievements and Clinical Advances in Modern Surgery. *Eur J Dent.* 2019; 13(2):280-286. doi:10.1055/s-0039-1696585
6. Ozer K, Colak O. Leucocyte- and platelet-rich fibrin as a rescue therapy for small-to-medium-sized complex wounds of the lower extremities. *Burns Trauma.* 2019; 7:11. doi:10.1186/s41038-019-0149-0
7. Khafagy YW, Abd Elfattah AM, Moineir W, Salem EH. Leukocyte- and platelet-rich fibrin: a new graft material in endoscopic repair of spontaneous CSF leaks. *Eur Arch Otorhinolaryngol.* 2018; 275(9):2245-2252. doi:10.1007/s00405-018-5048-7
8. Wang Y, Wang X, Chen R, et al. The Role of Leukocyte-Platelet-Rich Fibrin in Promoting Wound Healing in Diabetic Foot Ulcers. *Int J Low Extrem Wounds.* 2021; 1534734 6211052811. doi:10.1177/15347346211052811
9. Somani A, Rai R. Comparison of Efficacy of Autologous Platelet-rich Fibrin versus Saline Dressing in Chronic Venous Leg Ulcers: A Randomised Controlled Trial. *J Cutan Aesthet Surg.* 2017; 10(1):8-12. doi:10.4103/JCAS.JCAS\_137\_16
10. Napit IB, Shrestha D, Bishop J, et al. An individual randomised efficacy trial of autologous blood products, leukocyte and platelet-rich fibrin (L-PRF), to promote ulcer healing in leprosy in Nepal: the TABLE trial protocol. *Trials.* 2021; 22(1):453. doi:10.1186/s13063-021-05392-5
11. Ghatge A, Jawade S, Madke B, Singh A. Efficacy of Platelet-Rich Fibrin in the Treatment of Trophic Ulcer in Leprosy. *Skinmed.* 2021; 19(5):362-368
12. Simonpieri A, Del Corso M, Vervelle A, et al. Current knowledge and perspectives for the use of platelet-rich plasma (PRP) and platelet-rich fibrin (PRF) in oral and maxillofacial surgery part 2: Bone graft, implant and reconstructive surgery. *Curr Pharm Biotechnol.* 2012; 13(7):1231-1256. doi:10.2174/138920112800624472
13. Alpha Dental Practice (2022). L-PRF Platelet Therapy - Alpha Dental Practice. Accessed 22/10/2022 at: <https://www.alphadentalpractice.com › l-prf-platelet-the...>
14. Oral Surgery Partners. Accessed 27/10/2022 at: <https://www.redondo-oral surgery.com/procedures/our-technology/l-prf-platelet-therapy/>
15. Thompson HA. Blood transfusions and Jehovah's Witnesses. *Tex Med.* 1989; 85(4):57-9.
16. Pavlikova B, van Dijk JP. Jehovah's Witnesses and Their Compliance with Regulations on Smoking and Blood Treatment. *Int J Environ*

- Res Public Health. 2021; 19(1):387. doi:10.3390/ijerph19010387
17. Osório de Azambuja LE, Garrafa V. Jehovah's witnesses' positions on the use of hemocomponents and hemoderivatives. *Rev Assoc Med Bras.* 2010; 56(6): 705-10
18. Awale S. New treatment offers hope for Nepal's leprosy patients. *Nepali Times.* 12 July 2019. <https://www.nepalitimes.com/banner/new-treatment-offers-hope-for-nepals-leprosy-patients/>
19. Dehghan SK. Nepal hospital trials 'life-changing' treatment for leprosy wounds. *The Guardian.* 20 January 2022. <https://www.theguardian.com/global-development/2022/jan/20/nepal-hospital-trials-life-changing-treatment-for-leprosy-wounds>
20. McLenon J, Rogers MAM. The fear of needles: A systematic review and meta-analysis. *J Adv Nurs.* 2019; 75(1):30-42. doi:10.1111/jan.13818
21. McMurtry CM, Pillai Riddell R, Taddio A, et al. Far From "Just a Poke": Common Painful Needle Procedures and the Development of Needle Fear. *Clin J Pain.* 2015; 31(10 Suppl):S3-S11. doi:10.1097/AJP. 0000000000000272
22. Jenkins K. II. Needle phobia: a psychological perspective. *Br J Anaesth.* 2014; 113(1):4-6. doi:10.1093/bja/aeu013
23. Sokolowski CJ, Giovannitti JA Jr, Boynes SG. Needle phobia: etiology, adverse consequences, and patient management. *Dent Clin North Am.* 2010; 54(4):731-744. doi:10.1016/j.cden.2010.06.012
24. Altomare DF, Martinelli E, Picciariello A, Martines G, De Giorgi E. Fear and fascination of blood. *Horror sanguinis: Changes in meaning through centuries and cultures.* *Surgery.* 2021; 169(6):1553-1555. doi:10.1016/j.surg. 2021.01.015
25. Zucoloto ML, Gonçalves T, Menezes NP, McFarland W, Custer B, Martinez EZ. Fear of blood, injections and fainting as barriers to blood donation in Brazil. *Vox Sang.* 2019; 114(1):38-46. doi:10.1111/vox.12728
26. Tuft M, Nakken KO, Kverndokk K. Traditional folk beliefs on epilepsy in Norway and Sweden. *Epilepsy Behav.* 2017; 71(Pt A):104-107. doi:10.1016/j.yebeh.2017.03.032
27. Kowal E, Greenwood A, McWhirter RE. All in the Blood: A Review of Aboriginal Australians' Cultural Beliefs About Blood and Implications for Biospecimen Research. *Journal of Empirical Research on Human Research Ethics: An International Journal.* 2015; 10(4):347-359.
28. Copeman J. Introduction: Blood Donation, Bioeconomy, Culture. *Body & Society.* 2009; 15(2):1-28. doi:10.1177/1357034X09103435
29. Nabofa MY. Blood Symbolism in African Religion. *Religious Studies.* 1985; 21(3): 389-405
30. Umeora OIJ, Onuh SO, Umeora MC. Socio-Cultural Barriers to Voluntary Blood Donation for Obstetric Use in a Rural Nigerian Village. *Afr J Reprod Health.* 2005; 9(3):72-76
31. O'Neill S, Dierickx S, Okebe J, et al. The Importance of Blood Is Infinite: Conceptions of Blood as Life Force, Rumours and Fear of Trial Participation in a Fulani Village in Rural Gambia. *PLoS One.* 2016; 11(8):e0160464. doi:10.1371/journal.pone.0160464
32. Dorjay K, Tandon S, Singh A, Sharma S, Sardana K. Platelet rich fibrin: A novel treatment for trophic ulcer in Hansen's disease. *Trop Doct.* 2022;494755211069440. doi:10.1177/00494755211069440
33. Ghatge , Jawade S, Madke B, Singh A. Effi-

cacy of Platelet-Rich Fibrin in the Treatment of Trophic Ulcer in Leprosy. *Skinmed.* 2021; 19(5):362-368.

doi: 10.1057/s41271-020-00260-z

34. Sob D. The Situation of the Dalits in Nepal: Prospects in a New Political Reality. *Voice of Dalit.* 2012; 5(1):57-62. doi:10.1177/0974354520120105

35. Shrestha A, Joshi D, Roth D. The hydro-social dynamics of exclusion and water insecurity of Dalits in peri-urban Kathmandu Valley, Nepal: fluid yet unchanging. *Contemporary South Asia.* 2020; 28(3):320-335, DOI: 10.1080/09584935.2020.1770200

36. Nepali G. Discrimination on Dalit in Karnali and its Impact to Sustainable Development. *Research Nepal Journal of Development Studies.* 2018; 1(2): 84–95

37. Nightingale AJ. Bounding Difference: Intersectionality and the Material Production of Gender, Caste, Class and Environment in Nepal. *Geoforum.* 2011; 42:153–162.

38. Pariyar B, Lovett JC. Dalit Identity in Urban Pokhara, Nepal. *Geoforum.* 2016; 75:134–147

39. Houghton F, Winterburn M, Lama S, Cosgrove B. Lies, Damned Lies, Metrics & Semantics: Exploring definitions of the end of Leprosy (Hansen's Disease) & their implications. *Journal of Radical Statistics.* 2019; 123:4-14

40. Winterburn M, Houghton F, Lama S, Cosgrove B. Leprosy (Hansen's Disease): the WHO, Courage, and the Myth of 'Elimination'. *Medicina Internacia Revuo - International Medicine Review.* 2019; 28(113): 212–218

41. Houghton F, Winterburn M. Leprosy in Nepal: a re-emerging threat. *Journal of Public Health Policy.* 2021; 42(1):176-181.