Advice to health professionals: Use of lignocaine as a diluent to reduce the pain associated with the administration of benzathine penicillin G

To the Editor: Rheumatic heart disease (RHD) is a consequence of untreated group A beta-haemolytic streptococcal pharyngitis in a susceptible individual who is likely to live under social conditions of poverty.[1] There are over 30 million people with the disease, which is associated with over 300 000 deaths per year worldwide.[2] In Mozambique and South Africa, RHD is estimated to affect 20 - 30/1 000 asymptomatic schoolchildren.[3,4] Intramuscular penicillin is more effective than oral penicillin in the secondary prevention of acute rheumatic fever (ARF), and is highly effective for the primary prevention of ARF in children and young adults with pharyngitis.[5,6] Intramuscular benzathine penicillin G (BPG) is therefore a first-line drug for primary and secondary prevention of ARF and RHD.[5,7]

Pain is one of the major problems when intramuscular BPG is given. With this comes fear of the next injection, which is one of the barriers to the primary and secondary prophylaxis of ARF.[8] There is therefore a need to identify effective methods to reduce the pain associated with BPG injection, and to increase adherence to primary and secondary prevention measures for ARF. One of these measures is to use lignocaine (lidocaine) as a diluent of BPG for intramuscular injection. Lignocaine hydrochloride is a local anaesthetic agent which, if added to BPG, reduces the pain of injection and in the first 24 hours after injection, while not significantly affecting serum penicillin concentrations.[7,9] Its effectiveness can be increased by using a vibrating device with a cold pack.[10]

A randomised double-blind, crossover trial was carried out in 18 children aged 11 - 19 years who required prophylactic treatment for rheumatic fever.[9] The children were randomly divided into two groups: one received an injection of BPG diluted with 3.2 mL of sterile water, followed 1 month later by an injection of BPG diluted in lignocaine hydrochloride 1%, and the second group received the same regimen in the reverse order. Serum penicillin concentrations and subjective pain sensation were determined after each injection. Peak serum penicillin concentrations at 24 hours after injection were similar for both preparations, as were the other serum values measured throughout the month. The pain score immediately after the injection was significantly lower with the lignocaine than with the sterile water dilution. The data support our recommendation for the use of lignocaine hydrochloride 1% as a diluent for BPG.[7,11]

We call upon all health professionals who administer intramuscular BPG on a regular basis to seriously consider using 1% lignocaine hydrochloride as a diluent instead of sterile water in order to minimise the pain of injection and help to improve adherence to the regimen for secondary prevention of a chronic disease like RHD.

Geoffrey Madeira, Ana Olga Mocumbi
Chronic Non-communicable Disease Division, Instituto Nacional de Saúde, Ministério da Saúde, Maputo, Mozambique
geogirassol@gmail.com

Bongani M Mayosi
Department of Medicine, Groote Schuur Hospital and Faculty of Health Sciences, University of Cape Town, South Africa

1. Engel ME, Stander R, Vogel J, Adeyemo AA, Mayosi BM. Genetic susceptibility to acute rheumatic fever: A systematic review and meta-analysis of twin studies. PLoS One 2011;6(9):e25326. DOI:10.1371/journal.pone.0025326
2. Global Burden of Disease Study. Global, regional, and national age-sex specific all-cause and cause-specific mortality for 240 causes of death, 1990-2013: A systematic analysis for the Global Burden of Disease Study 2013. Lancet 2015;385(9963):117-171. DOI:10.1016/S0140-6736(14)61682-2
3. Marijon E, Celermajer DS, Tafflet M, et al. Rheumatic heart disease screening by echocardiography: The inadequacy of World Health Organization criteria for optimizing the diagnosis of subclinical disease. Circulation 2009;120(8):663-668. DOI:10.1161/CIRCULATIONAHA.109.849190
4. Engel ME, Haileamlak A, Zühlke L, et al. Prevalence of rheumatic heart disease in 4720 asymptomatic scholars from South Africa and Ethiopia. Heart 2015;101(17):1389-1394. DOI:10.1136/heartjnl-2015-307444
5. Manyemba J, Mayosi BM. Intramuscular penicillin is more effective than oral penicillin in secondary prevention of rheumatic fever: A systematic review. S Afr Med J 2003;93(3):212-218.
6. Robertson KA, Volmink JA, Mayosi BM. Antibiotics for the primary prevention of acute rheumatic fever: A meta-analysis. BMC Cardiovasc Disord 2005;5(1):11. DOI:10.1186/1471-2261-5-11
7. RHD Australia (ARF/RHD writing group), National Heart Foundation of Australia and Cardiac Society of Australia and New Zealand. Australian guideline for prevention, diagnosis and management of acute rheumatic fever and rheumatic heart disease (2nd edition). 2012. https://www.rhdaustralia.org.au/node/950/attachment (accessed 7 June 2016).
8. Balbaa A, ElGuindy A, Pericak D, Yacoub M, Schwalm J. An evaluation of secondary prophylaxis for rheumatic heart disease in rural Egypt. Glob Cardiol Sci Pract 2015;2015(3):40. DOI:10.5339/gcsp.2015.40
9. Amir J, Ginat S, Cohen YH, et al. Lidocaine as a diluent for administration of benzathine penicillin G. Pediatr Infect Dis J 1998;17(10):890-893. DOI:10.1097/00006454-199810000-00008
10. Russell K, Nicholson R, Naidu R. Reducing the pain of intramuscular benzathine penicillin injections in the rheumatic fever population of Counties Manukau District Health Board. J Paediatr Child Health 2014;50(2):112-117. DOI:10.1111/jpc.12400
11. Zeydi AE, Khezri HD. Can lidocaine be safely used to reduce pain caused by intramuscular penicillin injections? A short literature review. Oman Med J 2012;27(4):337. DOI:10.5001/omj.2012.85

S Afr Med J 2016;106(7):742. DOI:10.7196/SAMJ.2016.v106i7.10864