

Effects of 2G and 3G mobile phones on human alpha rhythms: Resting EEG in adolescents, young adults, and the elderly™

R.J. Croft^{1,2,3,*}, S. Leung^{1,3}, R.J. McKenzie^{1,3}, S.P. Loughran^{1,3}, S. Iskra^{1,3}, D.L. Hamblin^{1,3}, N.R. Cooper⁴
Bioelectromagnetics, Volume 31, Issue 6, pages 434–444, September 2010

Author Information

¹ Brain Sciences Institute, Swinburne University of Technology, Melbourne, Australia, ² School of Psychology, University of Wollongong, Wollongong, Australia ³ Australian Centre for Radiofrequency Bioeffects Research, Melbourne, Australia, ⁴ Department of Psychology, University of Essex, Essex, UK

Abstract

The present study was conducted to determine whether adolescents and/or the elderly are more sensitive to mobile phone (MP)-related bioeffects than young adults, and to determine this for both 2nd generation (2G) GSM, and 3rd generation (3G) W-CDMA exposures. To test this, resting alpha activity (8–12 Hz band of the electroencephalogram) was assessed because numerous studies have now reported it to be enhanced by MP exposure. Forty-one 13–15 year olds, forty-two 19–40 year olds, and twenty 55–70 year olds were tested using a double-blind crossover design, where each participant received Sham, 2G and 3G exposures, separated by at least 4 days. Alpha activity, during exposure relative to baseline, was recorded and compared between conditions. Consistent with previous research, the young adults' alpha was greater in the 2G compared to Sham condition, however, no effect was seen in the adolescent or the elderly groups, and no effect of 3G exposures was found in any group. The results provide further support for an effect of 2G exposures on resting alpha activity in young adults, but fail to support a similar enhancement in adolescents or the elderly, or in any age group as a function of 3G exposure. Bioelectromagnetics 31:434–444, 2010. © 2010 Wiley-Liss, Inc.