Journal of
Health and Medical Research

Abstract

The determination of cortisol from human sweat and fingermarks using High- Performance Liquid Chromatography (HPLC).

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Abstract:

Fingermark which is usually interchanged with fingerprints is the mark deposited on a surface by an unknown individual while fingerprints are the prints collected in a more controlled manner from known individuals. They include the whole top joint of the finger and are created using either ink or digital imaging. Fingermarks have a key role in identification and crime detection.

Three sweat glands are responsible for the production of sweat, they include eccrine, apocrine and apoeccrine glands. These glands spread throughout the whole-body surface where it freely opens on to the epidermal surface. The different glands produce sweat with different compositions. The three glands; sebaceous gland, eccrine and apocrine sweat glands are major contributors to the extent of fingermark residue.

A method was developed and validated for the analysis of cortisol in sweat and fingermarks using High performance liquid chromatography (HPLC). Agilent Eclipse Plus C18, 5µm 4.6 x 150mm, a flow rate of 1.0 mL/min, temperature was ambient, the wavelength was at 254 nm and an injection volume of 10 µL is described. The effect of mobile phase composition, injection

volume and the effect of liquid-liquid extraction was studied. A mobile phase of 10% acetonitrile in deionised water as solvent A and water as solvent B in a ratio of 40:60 was used and this allowed for a good separation of cortisol and the internal standard (6α-methylprednisolone) up to baseline. These results were also achieved by optimization the HPLC-UV/vis methods. The proposed method is reproducible, selective and sensitive, but less sensitive compared to other methods used for the analysis of cortisol recorded in previous studies. In addition to that, this method is less time consuming compared to Gas chromatography mass spectrometry (GC-MS) for the analysis of cortisol.

The method was applied to human sweat and fingermark samples from volunteers after exercise to determine the concentration of cortisol.

The possibility for the analytical procedure developed in this study to further our understanding of the analysis of cortisol has been shown.

Biography:

Abigail Anugengen is a biomedical and forensic scientist by profession and works in a biotechnology industry in Nigeria. She holds a BSc in Biomedical Science and a Masters degree in Forensic Science at the University of Lincoln, England. Abigail has more than 4 years of experience in biomedical practice and 2 years of forensic and QMS practice. She has also been involved in training scientists within Nigeria on quality management systems and the need for calibrating laboratory items while also being involved in forensic investigations. Abigail ia passionate about a bringing a positive change in laboratory investigations.

Publication of speakers:

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2. Baid, S. K., Sinaii, N., Wade, M., Rubino, D. and Nieman, L. K. (2007) 'Radioimmunoassay and tandem mass spectrometry measurement of bedtime salivary cortisol levels: A comparison of assays to establish hypercortisolism', Journal of Clinical Endocrinology and Metabolism, 92(8), pp. 3102– 3107. doi: 10.1210/jc.2006-2861.

Webinar on Women Health Science and Care, 7 September, 2020, Tokyo, Japan

Citation: Abigail Anugengen, University of Lincoln, School of Chemistry, Lincoln, England. Webinar on Women Health Science and Care, 7 September, 2020, Tokyo, Japan