



HAARANALYSE

Soweit in diesem Kontext personenbezogene Bezeichnungen nur in weiblicher oder nur in männlicher Form angeführt sind, beziehen sie sich generell auf Frauen und Männer in gleicher Weise.

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2 Kurzbericht

Haaranalyse ist die chemische Analyse einer Haarprobe. Haare müssen vor allem dann für retrospektive Analysen verwendet werden, wenn Blut und Urin nicht mehr die erwartete Substanz beinhalten, typischerweise z.B. nach einem Jahr. Die am meisten verbreitete akzeptierte Anwendung ist im Feld der forensischen Toxikologie und der Umwelttoxikologie. Verschiedene alternativmedizinische Bereiche nutzen ebenfalls Haaranalysen, aber diese Verwendung wird kontroversiell gesehen, da sie nicht standardisiert ist.

Die Haarprobe wird auf Inhalt von Mineralien, Metallen, Drogen, Medikamente und andere Substanzen getestet.

In der medizinischen Literatur (gesucht in Pubmed und Cochrane Database for CCT) existieren Studien auf Level 1-6 (nach der Skala der American Heart Association) für

- Drogen-, Alkohol-, Tabak- und Medikamententests
- Substanztests (Zinn, Magnesium, Kupfer, Blei, Uran, Schwermetalle)
- DNA Testung
- Dopingtests bei Sportlern
- Zusammenhang zwischen Krebs und Haarpflegeprodukten
- Unterschiede zwischen Haartypen
- Validitätsstudien der Haaranalyse
- Ernährungseinfluss auf Substanzveränderung

In alternativen pseudomedizinischen Angeboten wird die Haaranalyse zur Früherkennung diverser Krankheiten und Zustände (*sich anbahnenden Schäden, bei Haarausfall, Haarproblemen, Hauterkrankung, Neurodermitis, Herzkrankheit, brüchigen Nägel, Diät, Stoffwechselerkrankungen, bei allen unspezifischen Beschwerden, Fettleibigkeit, Störungen der Enzymsysteme oder Organe, Osteoporose usw.*) durchgeführt. Für diese Art der Anwendung wurden keine wissenschaftlichen Artikel gefunden, die Evidenz hierfür scheint keinen der Level der AHA zu erreichen.

Zur validen Beantwortung der Frage sollte diese genauer eingegrenzt werden:

- **Art der Haaranalyse (DNA Test, Substanztest, Mikroskopanschau)**
- **Zweck der Haaranalyse (Diagnose welcher Art von Krankheiten)**
- **Zielpopulation für die Haaranalyse**

3 Fragestellung

Die Methode der Haaranalyse soll bewertet werden.

Die Bewertung selbst soll nach einer Skala der American Heart Association <http://www.americanheart.org/presenter.jhtml?identifier=1200000> erfolgen, die zwischen folgenden 8 Levels unterscheidet:

- Level 1: Statistisch signifikante, randomisierte, kontrollierte Studien (Doppelblindstudien) oder Metaanalysen
- Level 2: Statistisch nicht signifikante, randomisierte, kontrollierte Studien (Doppelblindstudien) oder Metaanalysen
- Level 3: Prospektive, kontrollierte, aber nicht randomisierte Kohorten-Studien
- Level 4: Historische, nicht randomisierte Kohorten- oder Fall-Kontroll-Studien
- Level 5: Verlaufsstudien und Patienten
- Level 6: Tierexperimentelle Studien und mechanistische Modellstudien
- Level 7: Vernünftige Extrapolation von existierenden Daten
- Level 8: Rationale Vermutung

4 Definition

Haaranalyse ist die chemische Analyse einer Haarprobe. Haare müssen vor allem dann für retrospektive Analysen verwendet werden, wenn Blut und Urin nicht mehr die erwartete Substanz beinhalten, typischerweise z.B. nach einem Jahr. Die am meisten verbreitete akzeptierte Anwendung ist im Feld der forensischen Toxikologie und der Umwelttoxikologie. Verschiedene alternativmedizinische Bereiche nutzen ebenfalls Haaranalysen für Umwelttoxikologie, aber diese Verwendung wird kontroversiell gesehen, da sie nicht standardisiert ist.

Haaranalyse kann sich auf die forensische Technik der Bestimmung einer Anzahl verschiedener Haarcharakteristika hinsichtlich Gemeinsamkeiten beziehen, z.B. für den Vergleich von Haaren am Tatort eines Verbrechens mit den Haaren eines Verdächtigen.

Haaranalyse wird ebenso angewandt zur Entdeckung verschiedener therapeutischer und anderer Drogen wie Heroin, Benzodiazepine und Amphetamine. In diesem Kontext wird sie auch zur Compliancemesung therapeutischer Drogenentzugsregimes oder zur Kontrolle von Aussagen, dass keine Drogen eingenommen wurden, verwendet. Haaranalyse ist eine zunehmend verwendete Methode zur Kontrolle von Substanzmissbrauch, vor allem auch in Rechtsprozessen, oder in Bereichen, wo Personen der unwahren Aussage zu ihrer Drogenvergangenheit verdächtigt werden.

Haaranalyse wird in der Arbeitsmedizin, Umweltmedizin und einigen Bereichen der Alternativmedizin als zusätzliche Screening- oder Diagnose Methode genutzt. Die Haarprobe wird auf Inhalt von Mineralien und Metallen getestet, die Werte werden mit Expositionen verglichen. Manche Verfechter behaupten, dass damit ebenso Mineraldefizite diagnostiziert werden können, und dass autistische Menschen einen abnormalen Haarmineralgehalt haben¹.

5 Zum Thema Haaranalyse finden sich in Google

- Angebote für Drogentests: *Drogen und Medikamente lagern sich über die Haarwurzel im Haar ein und wachsen mit. Da Haare ca. 10-15 mm im Monat wachsen, kann über entsprechende Segmentierung der Haare auf einen zurückliegenden Konsum geschlossen werden. Zur Untersuchung benötigt man ein kugelschreiberdickes Haarbüschel, welches direkt an der Kopfhaut abgeschnitten wird. Einzelne Haare eignen sich nicht zur Untersuchung².*
- Wege zum Wohlbefinden: *Die Haaranalyse kann Klarheit über Ihren Mineralstoff- und Spurenelementehaushalt bringen. Toxische Stoffe können meist erkannt und natürlich ausgeschieden werden. Durch das langsame Wachstum des Haares können die ermittelten Resultate einer Haaranalyse wesentlich aussagekräftiger als bei Blut- oder Urinuntersuchungen sein, da diese lediglich die Werte des Entnahmetages anzeigen können³. (Auf der Seite wird darauf hingewiesen, dass aus rechtlichen Gründen keine Bestellungen aus Deutschland angenommen werden)*
- Mineralmedizinische Diagnostik: *Ratsam als Vorsorgeuntersuchung zur Früherkennung von sich anbahnenden Schäden, bei Haarausfall, Haarproblemen, Hauterkrankung, Neurodermitis, Herzkrankheit, brüchigen Nägeln, Diät, Stoffwechselerkrankungen (z. B. Diabetes), bei allen unspezifischen Beschwerden, Fettleibigkeit, Störungen der Enzymsysteme oder Organe, Osteoporose usw⁴.*
- Angebote für Vorsorgeuntersuchung: *Ihre Haaranalyse zeigt Unter- wie Überversorgungen und damit Disharmonien bzw. Belastungen noch lange bevor allfällige Krankheitssymptome auftreten. Bei der Haaranalyse wird Ihr Haar auf 30 Mineralstoffe, Spurenelemente und Schwermetalle untersucht⁵.*
- Und weitere ähnliche kommerzielle Verwendungen

6 Zum Thema Haaranalyse finden sich in medizinischen Datenbanken

6.1 Pubmed

- Studien zu Drogen- und Substanztests für die Umwelt- und Gerichtsmedizin (Quecksilber – Nuttall 2006⁶, Elhamri 2007⁷, Cernichiari 2007⁸, Ng 2007⁹, Srogi 2007¹⁰, Zinn - Gmshinskii 2006¹¹, , Drogen und Umweltgifte – Boumba 2006¹², Blei – Barbosa 2005¹³, Uran – Karpas 2005¹⁴, Schwermetalle – Villain 2004¹⁵, post mortem Toxikologie – Kaempe 1999¹⁶, Kintz 2004¹⁷, Magnesium – Lech 2000¹⁸, Michon 2002¹⁹, Antidepressiva und Antipsychotika – Shen 2002²⁰, Arsen – Hindmarsh 2002²¹)
- Studien zu Alkohol- und Drogenmißbrauch (Skender 2000²², Pragst 2006²³, Balikova 2005²⁴, Flanagan 2005²⁵, Alkohol und Tabak – Chan 2004²⁶, Kokain – Ursitti 2001²⁷, Normalwerte für Tabakspuren – Florescu 2007²⁸, Ergotamine – Favretto 2007²⁹, Missbrauchs- und therapeutische Drogen – Nakahara 1999³⁰, Klausz 2006³¹, Kintz 2006³², Cannabis – Huestis 2007³³, Musshoff 2006³⁴, Methadon – Shearer 2006³⁵, THC-COOH - Musshoff 2007³⁶, fatty acid ethyl esters als Indikator für Alkohol Missbrauch – Caprara 2006³⁷, Tabak – Al-Delaimy 2002³⁸, Conway 2004³⁹, Appel 2001⁴⁰)
- Studien zu Dopingtests an Sportlern (anabolische Steroide – Kintz 2003⁴¹, 2002⁴², 1998⁴³, Bevalot 2000⁴⁴)
- DNA Testung (Ohyama 2007⁴⁵, McGrath 2005⁴⁶, Linch 2001⁴⁷, Smith 1999⁴⁸, Lyman 2005⁴⁹)
- Studien zur Validität der Haaranalyse (Musshoff 2007⁵⁰, Kintz 2007⁵¹, Gill 2004⁵², Sukumar 2002⁵³, Spiehler 2000⁵⁴, Kidwell 2000⁵⁵, Mieczkowski 2000⁵⁶, Wennig 2000⁵⁷, Wolff 1999⁵⁸, Gaillard 1999⁵⁹, Karczewski 1998⁶⁰, Sachs 1998⁶¹)
- Zusammenhang zwischen Krebs und der Nutzung von Haarpflegeprodukten (Rollison 2006⁶², Takkouche 2005⁶³, Melanom – Rosso 2007⁶⁴, Lymphom – Correa 2000⁶⁵, de Sanjose 2006⁶⁶, Melanom – Weis 2006⁶⁷)
- Haartypen – Unterschiede (Franbourg 2003⁶⁸)

6.2 Cochrane Database of controlled trials

- Studien zu Dopingtests an Sportlern (anabolische Steroide – Segura 2000⁶⁹)
- Studien zu Drogentests (Kokain - Joseph 1999⁷⁰, Bernstein 2005⁷¹, Scheidweiler 2005⁷², Tassiopoulus 2006⁷³, Opid – Ali 2001⁷⁴, Ali 2001⁷⁵, Methadon – White 2001⁷⁶, 2002⁷⁷, Dolan 2003⁷⁸, Needles 2005⁷⁹)
- Studien zu Substanzbestimmungen (Zinn - Lachat 2006⁸⁰, Kupfer – Gorter 2004⁸¹, Magnesium – Martynov 2000⁸²)
- Studien zu Ernährungseinfluss (Baranowski 2002⁸³, Umeta 2007⁸⁴)

Suchstrategie

Google: 71.600 Einträge

Cochrane DB of HTA – 0

Cochrane DB of CCT – 118

Cochrane DB of Systematic Reviews – 17 – checked by title – none with the aim of hair analysis

Pubmed 27.5.2008

Search	Most Recent Queries	Time	Result
#18	Select 66 document(s)	05:25:28	66
#13	Search hair analysis Limits: Humans, Clinical Trial, Meta-Analysis, Practice Guideline, Randomized Controlled Trial, Review	05:24:40	1116
#12	Search (#10) AND (#8) Limits: Humans	04:19:48	206377
#10	Search "Sensitivity and Specificity"[Mesh] Limits: Humans	04:18:37	206377
#11	Search (#7) AND (#10) Limits: Humans	04:17:34	331
#8	Search sensitivity Limits: Humans	04:16:19	393190
#7	Search hair analysis Limits: Humans	04:14:59	9483
#2	Search hair analysis Sort by: PublicationDate	04:12:36	14755

Exkludiert nach Beurteilung auf Abstractebene

- anderes Thema (Mutti 2006⁸⁵, Leroy 2002⁸⁶, Price 2000⁸⁷, 2006⁸⁸, Whiting 1999⁸⁹, Pierard 2002⁹⁰, Kolioukas 2002⁹¹, Bjerring 1998⁹², Nguyen 1999⁹³, Hajheydari 2007⁹⁴, Hamzavi 2007⁹⁵, Perrenoud 2001⁹⁶, Beigi 2004⁹⁷, Guyatt 2004⁹⁸, Nanda 2004⁹⁹, Gridelli 2004¹⁰⁰, Korinek 2005¹⁰¹, Iraj 2005¹⁰², Venturoli 1999¹⁰³)
- keine Haaranalyse (Maurer 2000¹⁰⁴, Raposio 1998¹⁰⁵, Haedersdal 1999¹⁰⁶, Marcellin 2007¹⁰⁷, ten Bokkel 1999¹⁰⁸, Buzdar 2001¹⁰⁹, Kotsopoulos 2000¹¹⁰, Wellmer 2001¹¹¹, Perrenoud 2001¹¹², Overstreet 1999¹¹³, Veldre 2004¹¹⁴, Poree 2006¹¹⁵, Semiglazov 2006¹¹⁶, Pignata 2006¹¹⁷)
- legale Problematik (Kriukov 1999¹¹⁸)
- Haarverlust (Stough 2007¹¹⁹, 2002¹²⁰, Shin 2007¹²¹, Roberts 1999¹²², Sinclair 2005¹²³, Whiting 2003¹²⁴, Lyass 2000¹²⁵, Hubert 2000¹²⁶, Ferrari 2001¹²⁷)
- Tierstudie (Mateo 2007¹²⁸, O'Neill 2002¹²⁹)
- Alle Studien vor 1998

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- ¹ http://en.wikipedia.org/wiki/Hair_analysis, eigene Übersetzung
- ² <http://www.vonminden.de/haaranalyse.asp?sprache=de>
- ³ <http://www.sanascan.com/german/vorteile.html>
- ⁴ <http://www.mineralmedizin.at/haar.asp>
- ⁵ <http://www.burgerstein.at/main.aspx?TabID=309>
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Interpreting hair mercury levels in individual patients.
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The biological monitoring of prenatal exposure to methylmercury.
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Rev Environ Contam Toxicol. 2007;189:107-30.
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[Trace elements in human nutrition: biological indices of zinc insufficiency].
Vopr Pitan. 2006;75(6):4-11.
- ¹² Boumba VA, Ziavrou KS, Vougiouklakis T.
Hair as a biological indicator of drug use, drug abuse or chronic exposure to environmental toxicants.
Int J Toxicol. 2006 May-Jun;25(3):143-63.
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A critical review of biomarkers used for monitoring human exposure to lead: advantages, limitations, and future needs.
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Ann Acad Med Stetin. 2002;48:85-97.
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Detection of antidepressant and antipsychotic drugs in human hair.

Forensic Sci Int. 2002 Apr 18;126(2):153-61.

²¹ Hindmarsh JT.

Caveats in hair analysis in chronic arsenic poisoning.

Clin Biochem. 2002 Feb;35(1):1-11.

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Reference values for hair cotinine as a biomarker of active and passive smoking in women of reproductive age, pregnant

Ther Drug Monit. 2007 Aug;29(4):437-46.

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Highly specific quantification of ergotamine in urine, blood, and hair samples by liquid chromatography-tandem mass

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Cannabinoid concentrations in hair from documented cannabis users.

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