

HTA-Report | Summary

Dental indications for standardised procedures of instrumental functional analysis under consideration of health economic aspects

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Health political background

The HTA report evaluates the currently available evidence of the instrumental functional analysis as diagnostic procedures for craniomandibular or temporomandibular dysfunctions in comparison to the classic clinical functional analysis. In the following the authors use the term CMD for all dysfunctions and functional restrictions. Dental diagnostics for this disease complex is usually based on the clinical functional analysis, radiographic examinations and, if considered necessary, an instrumental functional analysis. The German Society for Functional Diagnostics and Therapy (Deutsche Gesellschaft für Funktionsdiagnostik und -therapie) recommends to conduct a clinical functional analysis first if CMD is suspected; and if the clinical functional analysis shows restrictions in the mandibular functioning, an instrumental functional analysis is to be performed afterwards. In dental practice functional diagnostics is often used as a component of function-therapeutic, prosthetic or orthodontical investigations. Since functional diagnostics are not designated to a specific field of dentistry, costs for instrumental diagnostics usually occur in the context of functional therapeutic measures, or prosthetic and orthodontic measures. An instrumental functional analysis causes substantial costs, which are not covered by compulsory health insurance funds, therefore costs for functional analysis must be remunerated privately. At the same time remarkable practice variability exists concerning diagnostics and therapy, which causes a substantial uncertainty among affected patients.

Scientific background

The superordinate term “dysfunctions of the mandibular” is used synonymously with the term “craniomandibular dysfunctions” and summarises a heterogeneous group of different pathologies with overlapping symptoms. Dysfunctions are understood as a dysfunctional illness with a complex aetiopathogenesis of multifactorial origin. The multitude of symptoms is probably caused by the damage to the mandibular joint. Internationally recognized definitions or systematic documentations of the craniomandibular dysfunctions or the instrumental functional analysis do not exist. Only in the past years two classifications received wider international acceptance: The clinical-oriented system of the American academy for orofacial pain and the empirically based diagnostic criteria for the research of temporomandibular dysfunctions. Historically the diagnosis of craniomandibular dysfunctions is established on the basis of clinical (and/or manual) findings and radiographic examinations. Numerous technical instruments are available for the measurement of additional findings. The authors consider amongst the het-

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Within the scope of the



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erogeneous group of the instrumental functional analyses all procedures, using an algorithm for recording, measuring and/or judging structural and/or functional restriction and dyscoordination of the anatomically and physiologically healthy motion and/or centric relation of condyles. In the literature the prevalence of symptoms of craniomandibular dysfunctions is described as having a very large range, whereby the symptoms are mostly described as slightly only. According to the results of the third mouth health study (Dritten Mundgesundheitsstudie) the prevalence in Germany is approx. 5%, and only approx. 3% of the affected patients require therapy. Current knowledge concerning the aetiology and the therapy of craniomandibular dysfunctions is insufficient, which is particularly frustrating and unsatisfactory for affected patients. The diagnosis of craniomandibular illnesses appears to be rather depending on the experience and the attitude of the treating dentist as on scientifically measurable criteria. This HTA is limited to the evaluation of publications on instrumental functional analyses compared with clinical investigations for the diagnosis craniomandibular dysfunctions.

Research questions

The goal of this HTA is the evaluation of the validity of instrumental diagnostics for craniomandibular dysfunctions in dentistry. In this context the following research questions are derived from a dentistry perspective:

- How valid is the instrumental functional analysis for the diagnosis of dysfunctions of the craniomandibular system in comparison to the classic clinical functional analysis?
- How valid are different instrumental functional analysis procedures in comparison amongst themselves for the diagnosis of dysfunctions of the craniomandibular system?
- Do differences in the validity of the technical equipments exist which are dependent from structural-functional, somatic, psychosocial or other factors?
- Where does a need for dental-epidemiological research exist given contradictory study results or missing high-quality studies?

From a health-economic perspective the following questions are formulated:

- How cost effective is the instrumental functional analysis?
- Which further questions should be considered when examining cost effectiveness and which possible results could be expected?
- Could the available information regarding cost effectiveness constitute a basis for health-political decision making? Which budgetary effects could result from it?

From an ethical, legal and social perspective the following research questions evolve:

- Which social, legal and ethical implications must be considered in the context of therapy of craniomandibular dysfunctions by instrumental functional analysis and is it possible to make any statements concerning this?
- Should the access to or the supply of diagnostic possibilities in Germany change, based on the medical or economical evaluation?

Methods

In order to evaluate the effectiveness and the efficiency of functional diagnostics for the diagnosis of craniomandibular dysfunctions, DIMDI conducts a systematic literature search in 27 data bases on the 20.09.2007 and as an update on the 13.05.2009. The literature search considers literature published since the year 1990 in German and English language. Four individual searches are conducted for medical, health-economic, ethical and legal topics. Additionally, the authors conduct an extensive by hand search.

Results

The DIMDI systematic database search results in a total of 962 hits, with 898 medical and 64 economic publications. After the exclusion of duplicates and the evaluation of headings and abstracts, 125 medical and 19 economic publications are requested in full text from DIMDI. The hand search results in an additional 37 medical and seven economic publications which are judged as possibly relevant for this HTA report. Due to missing relevance or poor methodical quality for the research questions, none of the 162 medical and 26 economic publications are included in this report.

Discussion

The inconsistent use of the expression “craniomandibular malfunction” and the heterogeneity of the instrumental functional analysis amongst different diagnostic procedures hamper the identification of relevant publications, as well as the comparability of the different results concerning the topic. In the context of this HTA report the instrumental functional analysis is seen as a diagnostic procedure for the diagnosis of dysfunctions of the craniomandibular system, however, the result of the evaluation of the published articles is that no answers can be given with regard to the research questions since no relevant results were found.

Conclusions/recommendations

In the context of this HTA report the validity of the instrumental functional analysis for the diagnosis of craniomandibular dysfunctions compared to the classic clinical functional analysis is examined on the basis of the published technical literature. It can be stated that the instrumental functional analysis until now is not described in systematically and independently validated studies comparing the clinical functional analysis in sufficiently large patient collectives using a reference standard. Therefore it remains unclear whether the performance of an instrumental functional analysis alongside with a clinical functional analysis should be recommended for the diagnosis of craniomandibular dysfunctions. In order to answer fundamental questions in relation to instrumental functional analysis for the diagnostics of craniomandibular dysfunctions, high-quality research studies should be conducted. Further research is needed. Additional needs for research exist concerning the development and implementation of medically effective and economically efficient guidelines for the structured modular diagnostics of craniomandibular dysfunctions. The mandatory use of structured guidelines could lead on the one hand to a significant reduction of false diagnoses (with their negative cost effects) and on the other hand facilitate sufficient diagnosis and therapy.