

Systematic Review of Surgical Management of Esophageal Atresia Pediatrics

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Abstract: Gastroesophageal reflux (GER) is a physiologic procedure. Regurgitation occurs in over 70% of babies multiple times a day, However it tends to disappear by the age of 12-14 months. Gastroesophageal reflux disease (GERD) is defined and identified. Troublesome symptoms in babies might consist of excessive weeping, back arching, regurgitation, and irritation around feeding. Six studies were included in which all conducted in tertiary centers from Europe (Italy, Spain, and Belgium). Data from 408 individuals (age 1 month-13.6 years) and 145 controls (age 1 month-13.6 years) were considered in this research. The main aim of the systematic review is to evaluate the diagnostic accuracy of commonly used diagnostic tests over conventional history taking and physical examination in children ≤ 18 months and >18 months suspected of gastroesophageal reflux disease (GERD).

Keywords: Gastroesophageal reflux (GER), apparent harmful events (ALTE).

1. INTRODUCTION

Gastroesophageal reflux (GER) is a physiologic procedure. Regurgitation occurs in over 70% of babies multiple times a day; however it tends to disappear by the age of 12-14 months. When GER leads to troublesome symptoms and/or issues ^(1,2), Gastroesophageal reflux disease (GERD) is defined and identified. Troublesome symptoms in babies might consist of excessive weeping, back arching, regurgitation, and irritation around feedings; these could be considered nonspecific. In kids and mainly in adolescents, heartburn is the more particular symptom occurring in GERD. Though problems are frequently moderate, they are troublesome and may have a significant effect on the well being of the kid and family life. Furthermore, complications as esophagitis and hematemesis, failure to prosper, or apparent harmful events (ALTE) have to be prevented whenever possible ^(3,4,5).

Identifying GERD in pediatric patients is challenging because no gold basic exists, and not one mix of symptoms is definitive. Currently, the diagnosis of GERD is based upon history and physical exam. This approach might be considered as the "gold standard." Nevertheless, there is a need to quantify GERD in a more unbiased way because the GERD diagnosis undergoes complimentary interpretation and is most likely overdiagnosed⁽⁶⁾. It might simulate disorders such as cow's milk allergy and eosinophilic esophagitis^(7,8).

Tests for GERD can be divided into 2 classifications: tests with the capability to measure reflux occasions (pH-metry, pH-impedance, barium contrast research studies, and scintigraphy) and tests to find the effects of reflux events (esophagogastroscopy).

The most widespread test utilized to measure GERD is 24-hour pH-metry. A pH < 4 in the esophagus is typically thought about as an acid reflux episode⁽³⁾. Acid exposure is expressed as the reflux index (RI, % of time a pH < 4 was determined), for which presently no proof based pediatric normal values exist. The European Society for Pediatric Gastroenterology, Hepatology, and Nutrition and North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition guidelines think about a RI > 7% as unusual, a RI <3% as typical, and in between 3% and 7% as indeterminate.

Barium contrast studies consist of a series of radiographs of the esophagus and stomach utilizing a barium emulsion to track swallows and possible reflux, which in some cases reveal structural anatomic causes underlying GERD⁽⁹⁾. In gastroesophageal scintigraphy, patients take in a (99) technetium labeled meal prior to start of the scans, and postprandial reflux becomes visible when labeled stomach contents move up-wards in the esophagus⁽³⁾.

Reflux esophagitis, among the complications of GERD, can be determined by esophagogastroscopy. This allows both microscopic and macroscopic grading of the esophageal wall. To date, there are inadequate information to support the use of histology in detecting GERD. Presently, the main factor for taking biopsies is to exclude other diseases triggering esophagitis such as eosinophilic esophagitis, Crohn's disease, and infections^(3,10).

Lastly, a trial with an antireflux agent may be utilized to detect GERD. A proton pump inhibitor (PPI) is often the agent of option and an empiric trial of 2-4 weeks is common⁽³⁾. Data on sensitivity and uniqueness is scarce, both in children and adults, amplified by the fact that GERD symptoms might improve spontaneously or respond by a placebo effect⁽³⁾.

The main aim of the systematic review is to evaluate the diagnostic accuracy of commonly used diagnostic tests over conventional history taking and physical examination in children ≤ 18 months and >18 months suspected of gastroesophageal reflux disease (GERD).

2. METHODOLOGY

We searched Medline, Embase, and the Cochrane database for studies assessing the diagnostic accuracy of pH-metry, pH-impedance, esophagogastroscopy, barium contrast study, scintigraphy, and empirical treatment as diagnostic tools. Quality was assessed according to Quality Assessment of Studies of Diagnostic Accuracy Included in Systematic Reviews criteria. The key words used to describe the study population were "esophagogastroscopy," "pH-metry," "pH-impedance," "gastric emptying scintigraphy," "barium radiography," "GER," "GERD," "heartburn," "extraesophageal symptoms," "reflux esophagitis," "infant," "child," and "adolescent" (medical subject headings and all fields). No language restriction was applied. Reference lists of reviews and included studies were searched for additional studies. The full search strategy is available from the authors. A hand search of the tables of contents of relevant journals published from January to December 2016 was then performed .

3. RESULTS AND DISCUSSION

Six studies included were all conducted in tertiary centers from Europe (Italy, Spain, and Belgium). Data from 408 individuals (age 1 month-13.6 years) and 145 controls (age 1 month-13.6 years) were considered in this research . Because of the heterogeneity, specifically for symptoms discussion of GERD between the included research studies with regard to all participants, diagnostic, and result steps, a meta-analysis was not possible, and all studies are for that reason, gone over individually. 5 studies consisted of children referred for symptoms and indications of GERD that could be considered as problematic (eg, regurgitation, throwing up, hematemesis, weight failure, and frequent pneumonia)⁽¹¹⁻¹⁵⁾, and 1 research study included kids with ALTE. Because ALTE was regarded as a possible presentation of GERD⁽¹⁶⁾, The latter study was included. This research study found no relationship between pH drops and the beginning of apneas, the latter being the possible reason for ALTE.

All 6 consisted of studies assessed the diagnostic worth of pH- metry (5 by glass electrode and 1 antimone electrode)⁽¹⁵⁾, and 2 studies assessed the diagnostic worth of esophagogastroscopy (macroscopy and histology) too^(14,15). Cut-off worths for pH-metry were defined in a different way as 1 or 2 SDs of the mean of the control group in 4 studies⁽¹¹⁻¹⁴⁾. In 1 research study, no cut-off worths were specified⁽¹⁶⁾. In the last research study, cut-off values were defined without additional recommendation to literature or explanation⁽¹⁵⁾. In 2 studies evaluating esophagogastroscopy, macroscopic criteria were defined in a different way.

In 3 research studies, it was possible to compute level of sensitivity for pH- metry of the extracted information^(12,13,15). Sensitivity varied from 41%-81%. Of the 2 research studies performing esophagogastroscopy, sensitivity was calculated for macroscopy from the drawn out information. Both sensitivity and specificity could be determined for histology.^(14,15) Hence, no research studies were retrieved fulfilling our addition criteria evaluating impedance, scintigraphy, barium swallow/radiograph of esophagus/stomach, and/or a diagnostic treatment.

In all consisted of research studies, the patient groups were representative for those patients who would receive a diagnostic test in clinical practice. Selection requirements were plainly described, and execution of the index test was

explained in enough detail to allow replication. Due to the fact that GERD symptoms and signs are not distinctive and, therefore, difficult to detect, it was unclear if the referral requirement (signs and symptoms) utilized in the 6 included research studies, was correctly categorizing the target condition. Nevertheless, in all research studies, except (1,11) symptoms and signs were clearly explained. Just in the study evaluating ALTE and GER, the time period between presentation of the signs and/ or symptoms (ALTE) and time of measurement was reported, which was 24-48 hours⁽¹⁶⁾. In the 2 studies assessing histology, assessors were blinded, however blinding treatment for macroscopy was uncertain^(14,15). For pH-metry, outcome assessors were blinded for the clinical profile of the included patients in 3 studies. Likewise, outcome assessors were uninformed about the pH-metry results when translating the results of history taking and health examination^(13,14,16). In 2 studies outcomes were assessed unblinded and in 1 research study this was unclear⁽¹⁵⁾. Neither uninterrupted nor intermediate test outcomes were reported; an explanation of withdrawals was not reported. Remarkably, withdrawals were not explained in any of the included studies.

This systematic review clearly shows that, despite a large number of publications, there is a lack of high quality studies of the diagnostic accuracy compared with the current definition of GERD, which is based on history and physical examination. Therefore, the accuracy of tests in children #18 months and >18 months suspected of GERD remains unclear.

4. CONCLUSION

Diagnostic accuracy of tests in children suspected of GERD remains unclear and ramifications for practice are hard to give. There is an immediate requirement of properly designed randomized regulated trials where the effect of treatment according to particular signs and symptoms will be compared with the effect of treatment based on the results of extra diagnostic tests, for patient appropriate outcomes.

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