Rev Esp Med Nucl. 2011;**30(5)**:297–300

Original article

Measurement of ^{75}Se-SeHCAT Abdominal Retention in the Initial Diagnosis of Bile Acid Absorption (BAM)☆

P.C. Notta, D. Ramal, S. Maisterra, A. Rodríguez Gasen, S. Maymó, A. Sabaté, A. Girbau, J. Guardiola, J. Martín-Comín*

Servicio de Medicina Nuclear y Servicio de Gastroenterología, Hospital Universitari de Bellvitge, Idibell, Hospitalet de Llobregat, Barcelona, Spain

ARTICLE INFO

Article history:
Received 23 December 2010
Accepted 8 March 2011

Keywords:
^{75}SEHCAT
Bile acid malabsorption
Chronic diarrhea

ABSTRACT

Aim: To evaluate the usefulness of the ^{75}SeHCAT abdominal retention (AR) measurement in the early diagnosis of diarrhea syndrome (DS).
Methods: Thirty-seven patients with diarrhea syndrome within the first month of evolution were prospectively evaluated. The ^{75}Se-SeHCAT abdominal retention was measured 4 and 7 days post-administration of 0.01 mCi of ^{75}SeHCAT. The test was performed prior to treatment and at 3 months when the baseline study was positive. The test was considered positive if the RA was <25% at 4th and <10% on the 7th day. The patients were followed up at 3 months. Depending on the response, 3 groups were established: (a) complete response: normalization of stool frequency, (b) partial response, decrease of frequency and (c) no response.
Results: Group A: The AR of ^{75}Se-SEHCAT was normal in 21 patients. Six were diagnosed of colonic diverticulosis, 8 of irritable bowel syndrome, 1 of lymphocytic colitis, 1 of post-gastroenteritis syndrome, 1 of celiac disease and 1 of stenosis of the cardia. Four are still under study. Group B: The AR of ^{75}Se-SEHCAT decreased in 16 patients. All showed abnormal AR at day 7 and all but 1 at day 4. Following administration of cholestyramine resin, 8 (50%) presented partial response and 8 presented (50%) complete response. At 3 months, AR had increased at day 4 and 9 at day 7.
Conclusion: The measurement of ^{75}SEHCAT abdominal retention allows the early diagnosis of bile acid malabsorption in 43% of the patients with DS. Measurement at 7 days seems more accurate than that at 4 days.

Medición de la absorción de los ácidos biliares en el diagnóstico inicial de la diarrea crónica

Palabras clave:
^{75}Se-SEHCAT
Diarrea crónica
Absorción de ácidos biliares

RESUMEN

Objetivo: Evaluar la utilidad de la prueba del ^{75}SeHCAT en el diagnóstico precoz del síndrome diarreico (SD). Se evaluaron prospectivamente 37 pacientes con SD de un mes de evolución.
Método: Se midió la retención abdominal (RA) de ^{75}SeHCAT 4 y 7 días post-administración de 0,01 mCi de ^{75}SeHCAT antes del tratamiento y a los tres meses en los pacientes con estudio basal positivo. La prueba se consideró positiva si la RA era: <25% el 4.° y <10% el 7.° días. Los pacientes fueron visitados a los tres meses. Según la respuesta se distinguió: *a*) respuesta completa: normalización del ritmo deposicional; *b*) respuesta parcial, disminución de la frecuencia/consistencia, y *c*) no respuesta.
Resultados: Grupo A: la RA fue normal en 21 pacientes. El diagnóstico fue: 6 divertículos colónicos, 8 síndrome de intestino irritable, 1 colitis linfocitaria, 1 síndrome post-gastroenteritis, 1 enfermedad celíaca, 1 estenosis de cardias y 4 continuan en estudio.
Grupo B: la RA disminuyó en 16 pacientes; todos mostraron una RA baja a los 7 días y solo uno a los 4 días. Tras la administración de resina de colestiramina, 8 (50%) presentaron respuesta parcial y 8 (50%) respuesta completa. A los tres meses, la RA había aumentado en tres pacientes al 4.° día y en 9 al 7.° día.
Conclusión: La medición de la RA de ^{75}Se-SEHCAT permite el diagnóstico precoz de la malabsorción de sales biliares en el 43% de pacientes con SD. La medición a los 7 días parece más precisa que la de los 4 días.

Introduction

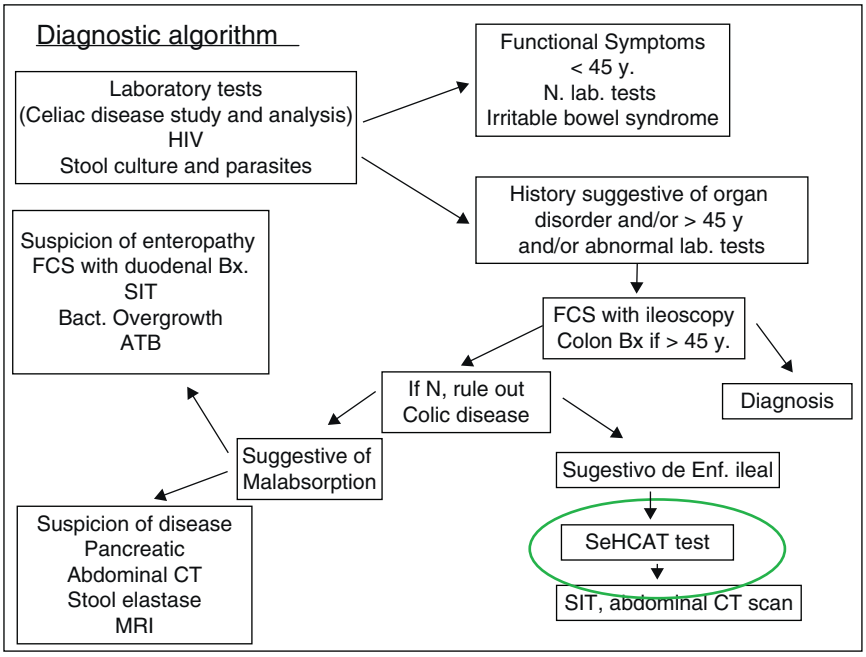
Diarrhea is a condition that usually lasts one or two days and that rapidly remits. On other occasions, it lasts longer and is complicated by fever, bed confinement or rectal bleeding. For this reason, 1.5% of the patients who suffer diarrhea require hospital admission.

Diarrhea is defined as a significant variation of the stool characteristics regarding previous bowel movement habits of the patient

☆ Please cite this article as: Notta PC, et al. Medición de la absorción de los ácidos biliares en el diagnóstico inicial de la diarrea crónica. Rev Esp Med Nucl. 2011;**30(5)**:297–300.

* Corresponding author.
E-mail address: jmartincomin@bellvitgehospital.cat (J. Martín-Comín).

1578-200X/$ – see front matter



Pbase. Lab. N: normal laboratory tests, FCS: Fibrocolonoscopy, Bx: biopsy, N: normal, TID: small bowel, CT: computed tomography overheating. Bact.: bacterial overgrowth, ATB: antibiotics, RM: MRI.

Fig. 1. Diagnostic algorithm of chronic diarrhea.

as regards to increased volume and/or frequency, with decreased stool consistency. Diarrhea should be distinguished from pseudodiarrhea, in which the frequency is increased but the stools have a solid consistency. In the literature, diarrhea is considered to exist when the stool weight exceeds 200 g/day.[1] However, this definition does not take into account that persons who have high insoluble fiber intake may usually have elevated stool weight (as high as 300 g/day). On the contrary, some subjects who consult due to diarrhea have normal stool weight but with liquid consistency. Arbitrarily, diarrhea is considered to be chronic when it lasts for more than 4 weeks.

It has a 3–5% prevalence in Western countries in the general population and 7–14% in the elderly population.[2] This makes this disorder an important cause of incapacity.

Chronic diarrhea may have multiple etiologies, both malignant and benign.[3] Different pathophysiological mechanisms are distinguished, among which poor absorption of bile salts is included (BAM).

Bile acids secreted to the lumen of the small intestine play a significant role in emulsification and digestion of fatty acids. Under normal conditions, the entry of bile acids into the colon is less than 5% given the combination of the passive diffusion produced in the small intestine and active absorption in the terminal ilium. The remaining 95% undergo enterohepatic circulation approximately 10 times within 24 h.[4] In each recirculation, another 5% of the total circulating acids are eliminated again.

The BAM causes the bile acids to increase in the colon, with the resulting consequence of a reduction in the absorption of electrolytes and water, producing aqueous diarrhea. Another factor that could be altered and therefore have an effect is increase of colonic motility.[5]

Currently, three are three recognized types of BAM. Type 1: due to ileal resection and/or bypass and diseases of the ileum; type 2: the idiopathic or primary BAM which is characterized by not being associated to an organic disorder and by favorably responding to cholestyramine[6,7]; and type 3 which is associated to different conditions, including postcholecystectomy diarrhea, diabetes, post-vagotomy, chronic pancreatitis, cystic fibrosis, celiac disease and some drugs.[8–11]

Medicine nuclear provides a test, this being the quantification of abdominal activity of the ^{75}Se-SeHCAT, for the examination of bile acid absorption. It has demonstrated an 80–90% and 70–100% sensitivity and specificity, respectively.[12–14] SeHCAT is the homotaurocholic acid (23-selena-25-homotaurocholic acid) labeled with ^{75}Se. It has a half life of 120 days and decays emitting gamma radiation of 136 and 265 keV. This radiopharmaceutical behaves like a bile acid, is mostly reabsorbed in the terminal ileum and is resistant to bacterial degradation, there being no false positives due to bacterial overgrowth.

The percentage of patients in whom BAM may be a cause of chronic diarrhea may be greater than 45%.[15] Diagnosis of BAM is not easy. In general, the diagnosis of the cause is delayed for weeks or months due to the performance of different tests in search of a specific diagnosis.

The diagnostic algorithms are based on retrospective studies or small-sized prospective ones (grade C) and on experts' opinion (grade D), since there are currently no controlled and directed studies in the investigation of chronic diarrhea (Fig. 1). These studies place the ^{75}Se-SeHCAT study in the third diagnostic line in spite of the previously mentioned sensitivity and specificity.

Our study has aimed to evaluate the utility of the quantification of abdominal retention of ^{75}Se-SeHCAT as a first-line diagnostic test in the early pathophysiological diagnosis of patients with chronic diarrhea.

Material and methods

Study population

A group of 37 patients (26 women and 11 men) with age range 25–80 years within the period of May 2009 to February 2010 were