

Contents lists available at [ScienceDirect](http://www.elsevier.com/locate/joa)

Journal of Arrhythmia

journal homepage: [www.elsevier.com/locate/joa](http://www.elsevier.com/locate/joa)

CrossMark

## Review

## Use of implantable and external loop recorders in syncope with unknown causes

Kaoru Tanno\*

Cardiovascular Division, Showa University Koto-Toyosu Hospital, 5-1-38 Toyosu Koto-Ku, Tokyo 135-8577, Japan

## ARTICLE INFO

## Article history:

Received 14 February 2017  
Accepted 27 March 2017

## Keywords:

Internal loop recorder  
External loop recorder  
Unknown Syncope

## ABSTRACT

The gold standard for diagnosing syncope is to elucidate the symptom-electrocardiogram (ECG) correlation. The ECG recordings during syncope allow physicians to either confirm or exclude an arrhythmia as the mechanism of syncope. Many studies have investigated the use of internal loop recorder (ILR), while few studies have used external loop recorder (ELR) for patients with unexplained syncope. The aim of this review is to clarify the clinical usefulness of ILR and ELR in the diagnosis and management of patients with unexplained syncope. Many observational and four randomized control studies have shown that ILR for patients with unknown syncope is a useful tool for early diagnosis and improving diagnosis rate. ILR also provides important information on the mechanism of syncope and treatment strategy. However, there is no evidence of total mortality or quality of life improvements with ILR. The diagnostic yield of ELR in patients with syncope was similar to that with ILR within the same timeframe. Therefore, ELR could be considered for long-term ECG monitoring before a patient switches to using ILR. A systematic approach and selection of ECG monitoring tools reduces health care costs and improves the selection of patients for optimal treatment possibilities.

© 2017 Japanese Heart Rhythm Society. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## Contents

1. Introduction	1
2. Internal loop recorders	2
2.1. Early diagnosis of unexplained syncope	2
2.2. Mortality and ILR	2
2.3. Quality of Life and ILR	2
2.4. Cost effectiveness	3
2.5. Adverse effects and disadvantages of the ILR	3
2.6. When should we use ILR?	3
3. External loop recorder	3
4. Conclusion	4
Conflict of interest	4
References	4
References	4

## 1. Introduction

The gold standard for diagnosing syncope is to elucidate the symptom-electrocardiogram (ECG) correlation. ECG monitoring is

an established procedure in the evaluation and monitoring of patients with syncope. The ECG recordings during syncope allow physicians to confirm or exclude an arrhythmia as the mechanism of syncope. Many studies have investigated the use of internal loop recorder (ILR), while there are few studies of external loop recorder (ELR) for patients with unexplained syncope. However, there is still some uncertainty in their clinical utility and practical approach. The aim of this review is to clarify the clinical usefulness

\* Fax: +03 6204 6396.

E-mail address: [k-tanno@med.showa-u.ac.jp](mailto:k-tanno@med.showa-u.ac.jp)<http://dx.doi.org/10.1016/j.joa.2017.03.006>1880-4276/© 2017 Japanese Heart Rhythm Society. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

of ILR and ELR in the diagnosis and management of patients with unexplained syncope.

2. Internal loop recorders

ILRs were developed in the early 1990s. They have a battery life of approximately 3 years and are able to record an ECG signal from small leads on either end of the device. Cardiac events can be detected manually or automatically and are saved on the device for up to 40 minutes. Since September 2016, ILR has been downsized. It is expected that the chances of using ILR will increase. Although ILR is used for patients with unexplained syncope, ILR research examines the following viewpoints: 1. Early diagnosis of unexplained syncope, 2. Mortality in patients with ILR, 3. Quality of life in patients with ILR, 4. Cost effectiveness, 5. Adverse effects of ILR, 6. When should we use ILR?

2.1. Early diagnosis of unexplained syncope

Many observational and four randomized control studies have investigated the use of the ILR [1]. The diagnostic yield of the ILR is higher than conventional testing, mainly due to prolonged monitoring periods [2–4]. ILR achieved a more rapid diagnosis in unexplained syncope than conventional techniques [5]. The Randomized Assessment of Syncope Trial (RAST) study randomized 60 patients to either conventional investigation with an ELR for 2–4 weeks, an electrophysiological testing, and a tilt-table test, or a prolonged monitoring for 1 year with an ILR. This study suggested that early implantation with ILR was more effective (52% diagnosed versus 20%) compared to the conventional strategy [2]. An ILR-guided diagnosis was demonstrated in 78% of 570 patients with pre-syncope or syncope during an average follow-up of 10 months in the multinational Place of Reveal in the Care Pathway and Treatment of Patients with Unexplained Recurrent Syncope Registry (PICTURE registry) [6]. In a meta-analysis, Solbiati reported on the diagnosis of ILR using four randomized control trials (Fig. 1). There was a significant difference in the number of diagnoses between patients who received ILR and those who were managed conventionally at a long-term follow-up [7]. In selected patients, the symptom-ECG correlation was as high as 88%, and the diagnostic value increased with increasing observation time [8,9]. Studies on ILR have also provided the important details of the mechanism and treatment strategy of syncope [10–14]. There are fewer papers regarding ILR for patients with unexplained syncope in Japan [15–17]. Onuki demonstrated that the estimated diagnostic rates of ILR for unexplained syncope were 47% and 65% at 1 and 2 years, respectively, in a single center retrospective observational study (Fig. 2). They also presented that the symptom-free rate of patients with ILR and patients with conventional investigation was approximately the same (Fig. 3). This means that the ILR does not have any effect on occurrence of the unexplained syncope [16]. Additionally, the ILR provides information about the

characteristics of the heart rhythm during syncope in patients with neutrally mediated reflex syncope, and it may help guide decisions regarding specific therapy [18–20].

2.2. Mortality and ILR

There is no research on ILR that evaluates life prognosis improvement as a primary endpoint. Only two studies reported data on mortality at one year and 18 months [2,3]. There was no evidence of a difference in the risk of mortality between patients with ILR and those who were managed conventionally at follow-up.

2.3. Quality of Life and ILR

Two studies analyzed quality of life in patients with ILR. Farwell measured quality of life using the Medical Outcomes Questionnaire (SF-12) and a visual analogue scale (VAS) at induction, 6, 12, and 18 months. They reported that there was a trend towards

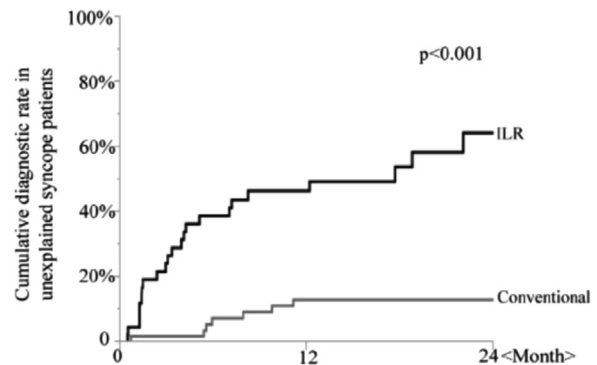


Fig. 2. Cumulative diagnostic rates between the use of an ILR and conventional tests. (Quoted from Onuki et al. [16]).

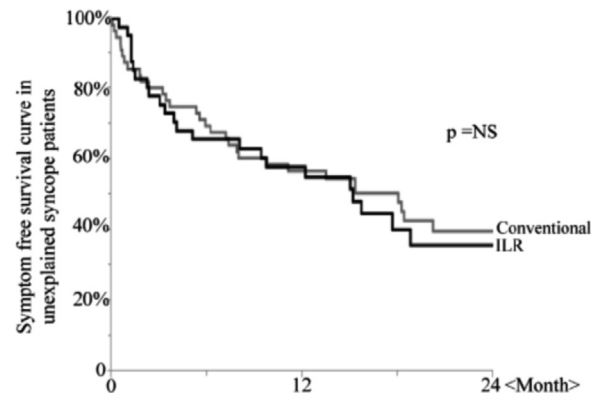


Fig. 3. Symptom-free survival curve for the use of an ILR and conventional tests. (Quoted from Onuki et al. [16]).

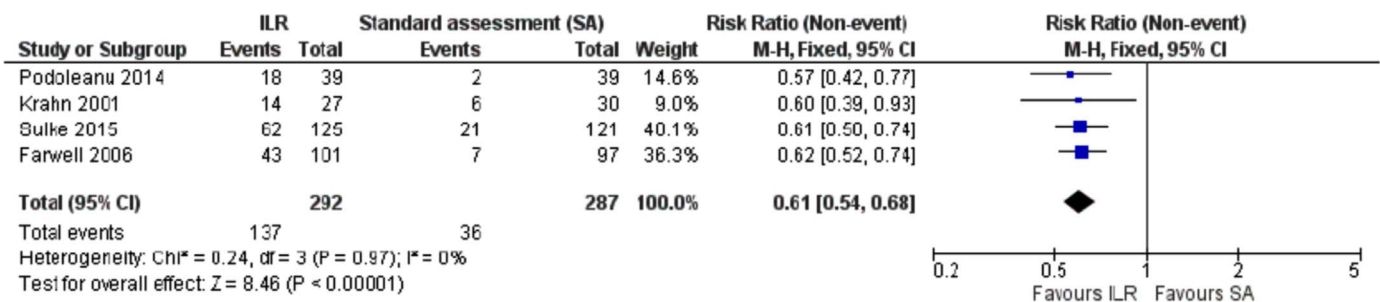


Fig. 1. Forest plot of comparison of ILR vs Standard Assessment. (Quoted from Solbiati M et al. [7]).

Download English Version:

<https://daneshyari.com/en/article/8667579>

Download Persian Version:

<https://daneshyari.com/article/8667579>

[Daneshyari.com](https://daneshyari.com)