

Epidemiology and patients' knowledge of implantable medical device management and safe use: results of a cross-sectional survey among the general population in Hungary

Áron Hölgyesi^{1,2}, Barbara Tóth³, Miklós Kozlovsky⁴, József Kuti⁵, Miklós Weszl⁶, Petra Baji^{7,8}, Levente Kovács⁹, László Gulácsi^{10,11}, Zsombor Zrubka^{10,11}, Márta Péntek¹⁰

¹ Doctoral School of Molecular Medicine, Semmelweis University, Budapest, Hungary; ² National Institute of Pharmacy and Nutrition, Department of Health Technology Assessment, Budapest, Hungary; ³ Doctoral School of Applied Informatics and Applied Mathematics, Óbuda University, Budapest, Hungary; ⁴ Department of BioTech Research Center, Óbuda University, Budapest, Hungary; ⁵ Antal Bejczy Center for Intelligent Robotics, Óbuda University, Budapest, Hungary; ⁶ Department of Translational Medicine, Semmelweis University, Budapest, Hungary; ⁷ Department of Health Economics, Corvinus University of Budapest, Budapest, Hungary; ⁸ Musculoskeletal Research Unit, University of Bristol, Bristol, United Kingdom; ⁹ Physiological Controls Research Center, University Research and Innovation Center, Óbuda University, Budapest, Hungary; ¹⁰ Health Economics Research Center, University Research and Innovation Center, Óbuda University, Budapest, Hungary; ¹¹ Corvinus Institute of Advanced Studies, Corvinus University of Budapest, Budapest, Hungary

Objectives

We aimed to assess the basic epidemiological characteristics of patients living with implantable medical devices (IMDs) and explore patients' self-perceived understanding of their use.

Methods

A cross-sectional online survey (July 2021) was conducted involving a sample (N=1400) representative for the 40+ years old Hungarian population in terms of age, sex, educational level and residency. Participant's IMD(s) history was recorded by self-reports. IMD's overall impact on patients' life and whether they received instructions for use regarding the use of their IMD were also recorded. Patients were also asked to indicate on a 0-10 visual analogue scale how familiar they are:

- Q1) with the instructions and lifestyle advice for everyday use of the IMD,
 - Q2) with the specific safety requirements for the IMD they are using,
- And how confident they are that they will be able to recognise in time if there is a problem with the IMD:
- Q3) that needs medical attention;
 - Q4) that requires information security or privacy control (Q4 only for pacemaker and glucose sensor users).

Results

- 30.9% (433/1400) of participants in the total sample were living with IMD
- Their mean age was 61.8 years (SD), 50.8% were female, 40.6% had tertiary education, 27.0% were living in the capital
- The most frequent IMDs were: tooth implant (N=134; 31%), intraocular lens (N=116; 27%), bone plate (N=77; 18%), abdominal mesh (N=37; 9%), hip implant (N=32; 7%), dental bone graft (N=32; 7%), coronary stent (N=26; 6%), knee implant (N=19; 4%), intrauterine device (N=18; 4%), spine implant (N=18; 4%), pacemaker (N=15; 3%), breast implant (N=13; 3%), artificial heart valve (N=6; 1%), glucose monitor (N=1), other (N=19; 7%)
- Mean age differed by IMD type (ANOVA $F_{14,548} = 7.74$, $p < 0.001$)
- Mean (SD) results on Q1-Q4 questions were 6.5 (3.2), 5.5 (3.8), 5.9 (3.4) and 5.8 (2.5), respectively
- Respondents' knowledge was associated with sociodemographic variables, self-perceived impact of IMDs on patients' life and instructions received for use (Figure 1.)

Conclusions

This is the first comprehensive epidemiological study on IMDs in Hungary. Patients' uncertainties regarding their role as IMD wearers draw attention to the need to improve patient education.

Figure 1. Patients' knowledge regarding living with IMD

