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Full Length Research Paper

Educational problems associated with abdominal ultrasonography for pediatricians in Japan

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In this study, we examined how pediatricians use abdominal ultrasonography and the educational problems associated with this technique for pediatricians in Japan. A simple questionnaire was distributed at the 2004 prefectural meetings of the Ibaraki and Tochigi chapters of the Japan Pediatric Society. Of the pediatricians who replied to the questionnaire, 38, 47 and 14% reported using abdominal ultrasonography often, sometimes, and never, respectively. Forty-two percent of those who use abdominal ultrasonography perform the procedure themselves; the rates were high among respondents in their thirties and forties, and the rates were highest in private practice and lowest in university hospitals and children's hospitals. Intussusception, fatty liver, and hydronephrosis can be diagnosed by the pediatricians themselves, while diagnoses of appendicitis and diseases of the reproductive system are difficult. Fifty- eight percent of the pediatricians who do not perform abdominal ultrasonography themselves had no chance to learn how to use the technique. The pediatricians wish to learn abdominal ultrasound from publications, seminars, and guidance by specialists. New trials of publications and seminars are currently ongoing and the development of a system to facilitate learning from specialists is needed.

Key words: Education, pediatrician, ultrasonography.

INTRODUCTION

Ultrasonography is a non-invasive method that can be performed repeatedly at the bedside. Moreover, it requires neither transfer nor sedation of the patient. Therefore, it is very useful in pediatric medicine. Echoencephalography is widely used in neonatology and echocardiography is used in pediatric cardiology. How-ever, these methods are rarely used by general pediatricians.

Gastro-esophageal reflux, hypertrophic pyloric steno-sis, intussusception, and acute appendicitis, which are diagnosed by ultrasonography, should be diagnosed both appropriately and rapidly by general pediatricians. It is clear that ultrasonography is an important method for abdominal examination, but this method is not used sufficiently by general pediatrician.

In this study, we examined how pediatricians use abdominal ultrasonography and the educational problems associated with this technique for pediatrician in Japan.

MATERIALS AND METHODS

A simple questionnaire was distributed at the 2004 prefectural meetings of the Ibaraki and Tochigi chapters of the Japan Pediatric Society (Table 1). The rate of reply was 57%, and the answers from 92 pediatricians were included in the final analysis.

RESULTS

The respondents' ages were as follows: twenties, 14%; thirties, 21%; forties, 33%; fifties, 27%; and sixties or more, 4%. Their workplaces were as follows: university hospital or children's hospital, 38%; general hospital, 37%; private office, 24%. The pediatricians under 50 years old work mainly at hospitals, and more than half of

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Table 1. Questionnaire

A. Questions for yourself
1. How old are you?
1) Twenties 2) Thirties 3) Forties 4) Fifties 5) Sixties or more
2. How long is it since graduation?
1) 1–2 years 2) 3–5years 3) 5–9 years 4) 10 years or more
3. Gender
1) Male 2) Female
4. Where do you work?
1) University hospital or Children's hospital 2) General hospital 3) Private
office B. Do you use abdominal ultrasonography?
1) Often 2) Sometimes 3) Never (to Question F) C.
How do you use abdominal ultrasonography?
1) Perform by oneself 2) Ask other doctors (to Question
F) D. How did you learn abdominal ultrasonography?
1) Taught by specialist 2) Self-study
E. Can you diagnose the following
diseases? Pyloric stenosis: 1) Yes 2) No
Intussusception: 1) Yes 2) No Appendicitis:
1) Yes 2) No
Fatty liver: 1) Yes 2) No
Hydronephrosis: 1) Yes 2) No
F. Why do you not perform abdominal ultrasonography yourself?
1) Do not feel it is necessary 2) Have no instrument 3) Have no chance to learn abdominal ultrasonography 4) Other
G. Have you read books or magazines about abdominal ultrasonography?
1) Read many times and understand them 2) Read many times, but do not understand them 3) Do not read
them. H. Do you wish to read books or magazines that are easy to understand?
1) Yes 2) No
I. Do you wish to attend seminars regarding abdominal ultrasonography?
1) Yes 2) Maybe 3) No
J. How do you wish to study abdominal ultrasonography?
1) Books or magazines 2) Seminars 3) Guidance from a specialist 4) Other 5) Do not wish to study abdominal ultrasonography.

those over 50 years old work at private offices (Figure 1). Thirty-eight percent use abdominal ultrasonography often, while 47 and 14% use this technique only sometimes and never, respectively. One third of the pediatricians over 50 years old and one third of pediatricians at private offices never use abdominal ultrasonography (Figures 2 and 3).

Forty-two percent perform abdominal ultrasonography themselves, with high rates of usage among those in their thirties and forties (Figure 4). The rate is highest in private practice and lowest in university hospitals or child en's hospitals (Figure 5). The ways in which pediatriccians reported learning abdominal ultrasonography were teaching by a specialist (43%) and self-study (57%). Intussus-ception, fatty liver, and hydronephrosis can be diagnosed by the pediatricians themselves; however, diagnosis of appendicitis is difficult (Figure 6). Fifty-eight percent of the pediatricians who do not perform abdominal ultra-sonography themselves reported having had no chance to learn how to perform the procedure. Sixteen percent have no equipment to perform abdominal ultrasonography, and only 6% reported that they feel this method is unnecessary.

Twenty percent of the respondents read and understand publications about abdominal ultrasonogra-phy, while 73% read but do not understand these publications. Seven percent reported that they do not read these publications because they have no interest in this methodology.

Eighty-six percent of the respondents reported that they wish to read understandable publications about abdominal ultrasonography, and 88% reported that they wish to

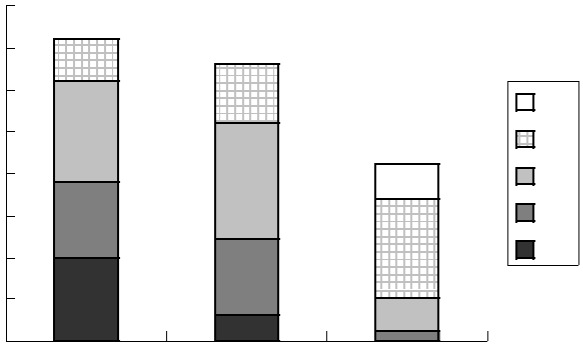

Figure 1. Ages and workplaces of the respondents. University, pediatricians who work at university hospitals or children's hospitals; General, pediatricians who work at general hospitals; Private, pediatricians who work in private offices. 20, pediatricians in their twenties; 30, pediatricians in their thirties; 40, pediatricians in their forties; 50, pediatricians in their fifties; 60, pediatricians aged sixty or more.

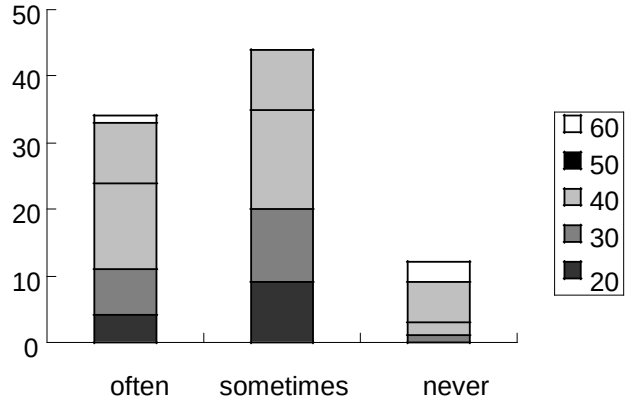

Figure 2. Differences in frequency of using abdominal ultrasonography according to age.

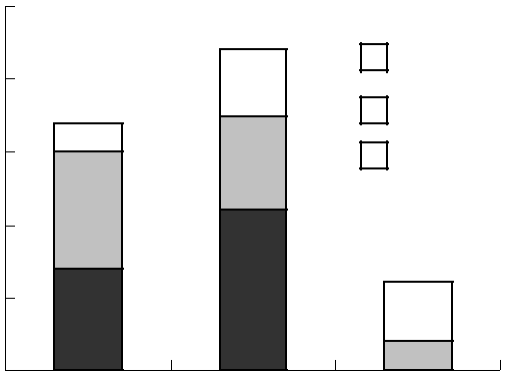

Figure 3. Differences in frequency of using abdominal ultrasonography according to workplace.

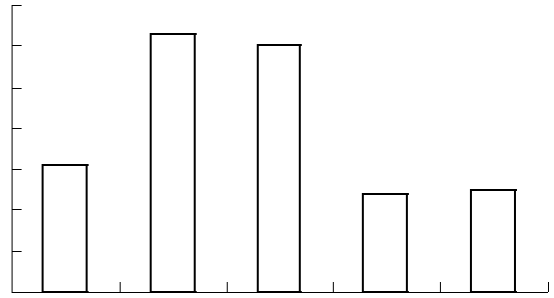

Figure 4. Rate of ultrasonography performed by the pediatricians themselves according to differences in age.

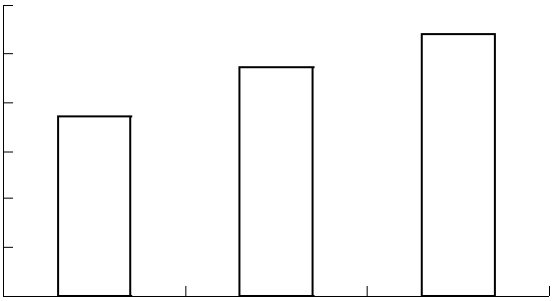

Figure 5. Rate of ultrasonography performed by the pediatricians themselves according to differences in workplace.

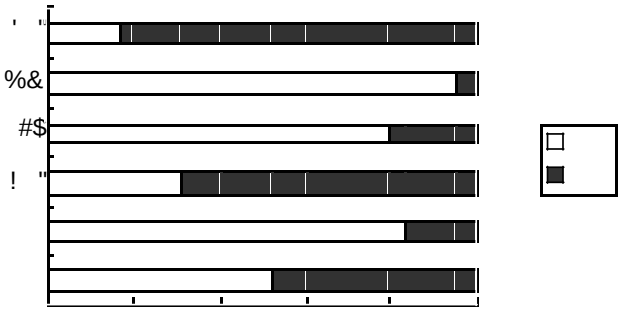

Figure 6. Possible ultrasonographic diagnosis by pediatricians. Appe., appendicitis; Fl, fatty liver; HN,hydronephrosis; IS, intussusception; PS, pyrolic stenosis; Repro., disease of reproductive system. Yes, diagnosable; no, not diagnosable

attend seminars about this method. Ways to learn abdominal ultrasound includes publications (48%), seminars

(54%) , and guidance by specialists (62%). Three percent of the respondents reported that they have no interest in learning abdominal ultrasonography.

DISCUSSION

From the results of this study, it is clear that many pediatricians understand the usefulness of abdominal ultrasonography and use this method in their clinical practice. However, one third of the pediatricians aged more than fifty never use this technique. This may be because they have had few chances to learn the proce-dure, because it was not recognized as a useful tool for diagnosis of pediatric abdominal diseases 20 years ago. One third of the pediatricians working at private offices (76% of the pediatricians at private offices were more than 50 years old) never use abdominal ultrasonography for the same reason. Similarly, the rates of pediatricians in their fifties and sixties who perform abdominal ultraso-nography themselves were low, as was the rate for those in their twenties. This latter group may also have had few chances to learn the procedure due to the short period of their medical experience. The low rate of abdominal ultrasonography use among pediatricians working at university hospitals or children's hospitals may be due to requests to specialists in the institute. Intussusception, fatty liver, and hydronephrosis can be diagnosed by pediatricians themselves, because ultrasonograms of these diseases are characteristic.

More than half of the pediatricians who do not perform abdominal ultrasonography by themselves had no chance to learn how to use this method. Only 6% re-ported that they do not feel that abdominal ultrasono-graphy is necessary. Therefore, it is necessary to increase the chances for pediatricians to learn abdominal ultrasonography.

Seventy-three percent of the respondents read but do not understand publications about abdominal ultrasonography. The publications prior to this questionnaire survey showed only images of ultrasonography, and it was difficult to understand how to perform abdominal ultraso-nography based on these publications. More than 80% of the respondents reported that they wish to read publi-cations about abdominal ultrasonography and they expect these publications to be easily understood. Some recent books present not only images of ultrasonography, but also explain the diagnostic process, describe how to move the probe, and explain how to obtain good images. It is possible to provide movies showing the movement of the probe along with ultrasonograms on CD. Eighty-eight percent of the respondents reported that they wished to attend seminars about abdominal ultrasonography. Recent meetings have included hands-on seminars or live demonstrations, not only to explain ultrasonographic images, but also to teach how to obtain these images.

Ways that the pediatricians wish to learn abdominal ultrasound include publications, seminars, and guidance by specialists at rates of 48, 54 and 62%, respectively. Most pediatricians under 50 work at hospitals, where specialists are likely to available. More than half of the pediatricians in hospitals only ask the specialists to perform ultrasonography and lose the chance to learn from the specialist. It is necessary to construct a system to learn ultrasonography from specialist in hospitals. Similar problems are also encountered in other fields of pediatric ultrasonography (Davis et al., 2005).

There are no formal training guidelines or compulsory training requirements for neonatal cranial ultrasound in the UK, (Reynolds et al., 2001) although the British Society of Paediatric Radiologists (BSPR) has a technical standard for neonatal cranial ultrasound scans on their website (www.bspr.org.uk). There are some guidelines for training regarding pediatric echocardiography (Fouron et al., 1998; Meyer et al., 1987; Sanders et al. 2005). It may be necessary to develop guidelines for training regarding pediatric abdominal ultrasonography.

It is clear from the results of this study that most pediatricians wish to learn abdominal ultrasonography. New trials of publications and seminars are currently ongoing and the development of a system to facilitate learning from specialists is needed.

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Technical standard: Neonatal Cranial Ultrasound Scans. www.bspr. org. Uk.