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Fibroscan Training to Paramedical Staff – A Gamechanger in Developing Countries

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1. Abstract

1.1. Introduction: Fibroscan is noninvasive, safe, quick, inexpensive, and reliable tool to evaluate fibrosis and cirrhosis of liver and works by measuring shear wave velocity. Thus, as per practice followed in developed countries, paramedical staff can be trained for the same, so as to make this test easily and daily available for the patients.

1.2. Objective: To train paramedical staff including Nursing officers and Endoscopy technicians for performing Fibroscan.

1.3. Methods: This study was conducted at Medical Gastroenterology Department at PGIMS, Rohtak over a period of eight years (2015-2023). It was a prospective study pertaining to total number of Fibroscan performed by Paramedical staff including Nursing officers and Endoscopy technicians. These paramedical staff were first trained for performing the Fibroscan, on the same pattern on which doctors were trained. Later on the paramedical staff also underwent refresher course training and updating about techniques of Fibroscan machine by the concerned company which regularly checked about accuracy of tests being performed by them. In total 30,000 Fibroscan were done in eight years by Paramedical staff.

1.4. Observations & Results: In eight years, total 30,000 Fibroscan were done by three Nursing officers and two Endoscopy technicians. Out of these, 18000 (60%) were males and 12,000 (40%) were females. The accuracy of Fibroscan being done were intermittently cross checked by trained doctors in the department and trainers who trained these paramedical staff in performing Fibroscan and it was found to be satisfactory.

1.5. Conclusion: In developing countries like India where doctor-patient ratio is not as per requirement due to shortage of manpower, there is need of training of paramedical staff for non-invasive procedures like Fibroscan. This leads to more efficient delivery of health care facility to the needy patients.

2. Introduction

The progression of liver fibrosis progresses to cirrhosis leads to increase in morbidity and mortality. In past, diagnosis of fibrosis and risk stratification relied on invasive tools such as liver biopsy which is expensive and associated with risk. The widespread screening for hepatitis C (HCV) and hepatitis B (HBV) and increasing prevalence of nonalcoholic fatty liver disease (NAFLD), the population presenting to the care of gastroenterologists and hepatologists will surely increase [1]. There is a critical need for a noninvasive, safe, quick, inexpensive, and reliable tool to evaluate these patients at the point of care. Vibration-controlled transient elastography (VCTE) works by measuring shear wave velocity. In this technique, a handheld probe is placed in the intercostal space overlaying the right hepatic lobe. The velocity of returning shear waves, measured at a depth of 25–65 mm, is converted into a liver stiffness measurement (LSM) by using Hook's law. The resistance to deformation in a given material under stress is expressed by Young's modulus in kilo pascals (kPa). VCTE uses the formula E ¼ 3pV2 which is based on Hook's law, where E is Young's modulus, p is mass density (assumed to be 1000 kg/m3, and V is the velocity of the shear wave [2]. Important LSM confounders include obesity, inflammation, cholestasis, congestion, and food intake. The reproducibility of VCTE has been examined by multiple

groups first in 2007 by Fraquelli et al [3]. Fibroscan is non invasive test and carries no risk to patient and doctors performing it are also trained by company supplying it. Thus, it was thought that as per practice followed in developed countries, paramedical staff should be trained for the same, so as to make this test easily and daily available for the patients.

3. Objective

To train paramedical staff including Nursing officers and Endoscopy technicians for performing Fibroscan.

4. Methods

This study was conducted at Medical Gastroenterology Department at PGIMS, Rohtak over a period of eight years (2015-2023). It was a prospective study pertaining to total number of Fibroscan performed by Paramedical staff including Nursing officers and Endoscopy technicians. These paramedical staff were first trained by the company which supplied the Fibroscan, on the same pattern on which doctors were trained. The paramedical staff also underwent refresher course training and updating about techniques of Fibroscan machine by the concerned company. In total 30,000 Fibroscan were done in eight years by Paramedical staff. The female patient underwent Fibroscan by female Nursing officers and male patient Fibroscan was done by male endoscopy technicians. The Fibroscan were done in fasting stage for various liver associated conditions like Nonalcoholic fatty liver disease, Hepatitis B & C, autoimmune liver disease, drug induced liver injury, alcoholic liver disease etc.

Observations & Results- In eight years, total 30,000 Fibroscan were done by three Nursing officers and two Endoscopy technicians. Out of these, 18000 (60%) were males and 12,000 (40%) were females. Around 16,500 patients (55%) belonged to rural background and 13,500 patients (45%) belonged to urban area. The three Nursing officers did 18,000 Fibroscan (60%) whereas 12,000 (40%) were done by Endoscopy technicians. The accuracy of Fibroscan being done were intermittently cross checked by trained doctors in the department and trainers who trained these paramedical staff in performing Fibroscan and it was found to be satisfactory (Table 1).

Table 1: Showing Distribution Parameters of Fibroscan.

Total Number of Fibroscan	Males	Females	Rural Background	Urban Background	Performed by Nursing Officer	Performed by Endoscopy Technician
30000	18000	12000	16,500	13,500	18000	12000
	-60%	-40%	-55%	-45%	-60%	-40%

5. Discussion

The Fibroscan machine was installed in the Department of Medical Gastroenterology, Post Graduate Institute of Medical Sciences (PGIMS, Rohtak) in 2015. In the starting, Fibroscan was being done by the author himself who was trained by the company who supplied this machine to the department. As, department is principal nodal center as well as model treatment center for hepatitis B & C under National Viral Hepatitis Control Program (NVHCP), thus outdoor patients are seen on daily basis and there is huge load of patients suffering from various kind of liver diseases. Thus, Fibroscan were started after outdoor patient consultation were finished and at the same time endoscopy & colonoscopy of listed patients were to be also done. Despite the fact that the facility of Fibroscan was without any charge and on daily basis but patient waiting period was around 3-4 hours. At this point of time, it was thought that on pattern of developed country, where noninvasive procedures like Fibroscan and Echocardiography etc. are done by trained paramedical staff, in the same way paramedical staff in the department can be trained. The three available female Nursing officers and two male endoscopy technicians were trained by the same company who trained the author and supplied Fibroscan machine to the department. Later on the paramedical staff also underwent refresher course training and updating about techniques of Fibroscan machine by the concerned company which regularly checked about accuracy of tests being performed by them which was found to be satisfactory. In total 30,000 Fibroscan were done in eight years by Paramedical staff. By doing this, the waiting period of patient substantially reduced from 3-4 hours to 15-20 minutes only. Around 40 Fibroscan were done on daily basis, that too without any waiting list and free of cost. The female Fibroscan was exclusively done by female nursing officer which led to increased confidence in female patients. The male Fibroscan was preferably by male endoscopy technicians. It also led to decrease pressure work on the doctor and time saved from Fibroscan was spent on treating patients. The immediate Fibroscan results led to early diagnosis and institution of treatment. The good effectivity of Nurse led Fibroscan in outreach program for alcoholic liver disease patients has already been established by Mathews etal [4]. The concept of getting Fibroscan performed by Paramedical staff can prove to be very beneficial in developing countries like India which has scarcity of doctors who are already overburdened by patients load. It can also pave way for diversifying knowledge of other non-invasive tests like Echocardiography to Paramedical staff which after proper training can do these tests with accuracy, in interest of better patient management and care.

6. Conclusion

In developing countries like India where doctor- patient ratio is not as per requirement due to shortage of manpower, there is need of training of paramedical staff for non-invasive procedures like Fibro-scan. This leads to more efficient delivery of health care facility to the needy patients.

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