Original Articles

The extent of familial hypercholesterolemia instruction in US schools and colleges of medicine, pharmacy, and osteopathic medicine

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KEYWORDS:
Familial
hypercholesterolemia;
Curriculum;
Pharmacy;
Medicine;
Osteopathic;
Instruction

BACKGROUND: Familial hypercholesterolemia (FH) is a common autosomal codominant disease characterized by extreme plasma cholesterol concentrations and high risk of early heart disease. FH is underdiagnosed and severely undertreated. This may be due in part to gaps in FH education within medical and pharmacy training programs.

OBJECTIVES: To assess the extent to which FH is covered in professional curriculums in accredited schools and colleges of medicine, pharmacy, and osteopathic medicine in the United States.

METHODS: An 18-question survey was distributed via e-mail to 288 US schools and colleges of medicine, pharmacy, and osteopathic medicine.

RESULTS: Fifty-six of 288 (19.4%) programs responded to the survey. Three were excluded from analysis because of lack of program accreditation and FH instruction. Overall, 43% indicated that FH instruction at their respective institution was perceived to be adequate. More than 90% of the programs indicated that the following topics were covered within the curriculum: FH pathophysiology; associated morbidity and mortality; guideline-recommended low-density lipoprotein cholesterol goals and risk factor management; consequences of poor lipid management; and the screening, diagnosis, and treatment of adult patients. However, instruction was lacking for FH screening methods as one-third of the programs covered cascade screening and only half of the programs reported distinguishing between heterozygous and homozygous FH including differences in treatment approach.

CONCLUSIONS: The results suggested important gaps in the coverage of FH in the curriculum, and strategies need to be developed to ensure that FH instruction is sufficient within these professional programs.

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Introduction

Familial hypercholesterolemia (FH) is a common autosomal codominant disease characterized by significantly elevated plasma cholesterol concentrations beginning in utero and extreme risk of early atherosclerotic cardiovascular disease (ASCVD). The prevalence of FH is estimated

to be at least 1 in 500 individuals of all ethnicities[1–3] and 1 in 250 individuals of Northern European descent due to founder effects.[4] Approximately 1% of the estimated 20 million patients with FH have been diagnosed in most countries, and those diagnosed remain severely under-treated.[3] Untreated FH patients have roughly 20 times the risk of developing ASCVD compared with the general population.[1] Patients with untreated heterozygous FH (HeFH) are at a high risk for developing ASCVD before the age of 50 years for men and 60 years for women, whereas those with untreated homozygous FH (HoFH) may die before the age of 20 years.[3]

The underdiagnosis and undertreatment of FH is likely multifactorial. Most countries do not have a formal family screening or cascade screening program, which involves screening of all first- or second-degree relatives of the proband.[3] A cascade screening program is beneficial as it allows for early detection and use of preventative interventions such as lifestyle modifications, cholesterol-lowering medications, and lipoprotein apheresis when indicated.[4,5] Gaps in the practitioner's knowledge about FH may also contribute to the underdiagnosis and undertreatment of the disease. Previous studies found that the physician's knowledge of FH is suboptimal.[6–8] The studies revealed that practitioner awareness was lacking about the national guidelines, heritability, prevalence, diagnostic features, and the risk of premature coronary heart disease (CHD) associated with FH. The use of population-based CHD risk calculators also contribute to undertreatment of the disease because they often substantially underestimate the risk of CHD in patients with FH.

Formal teaching about the prevalence of FH, diagnostic criteria, role of cascade screening, treatment options, and international guidelines are therefore important parts of graduate medical and pharmacy education.[9] This knowledge gap may potentially originate from inadequate coverage of FH within the curricula of medical and pharmacy education programs. Therefore, the aim of this study was to determine the extent of FH instruction in accredited schools and colleges of medicine, pharmacy, and osteopathic medicine across the United States.

Methods

Curricular survey

A survey instrument consisting of 18 "check box" or "fill in the blank" questions (see Appendix I) was created utilizing SurveyMonkey (CA) and was designed to be completed in 15 min. The structure of the survey was based on previous curricular surveys published in the literature[10–14] but with a focus on FH. Survey questions inquired about the demographics of the school or college such as the program type (pharmacy, medical, or osteopathic medicine), accreditation status, whether the school was private or public, average class size, length of the program, association of the school or college with a teaching hospital or lipid clinic, and the number of faculty members who specialize in the evaluation and treatment of lipid disorders. The survey also questioned participants about the number of lecture hours dedicated to FH, the perceived adequacy of FH instruction at the institution, faculty resources available to teach FH, whether FH material is covered in required and/or elective courses, methods the institution used for FH instruction, and whether pathophysiology, epidemiology, screening, and treatment were covered for adult and pediatric patients. Before distribution, the curricular survey was beta-tested by students and faculty members within the Oregon State University/Oregon Health & Science University College of Pharmacy. Institutions were excluded if not accredited or if zero hours of FH instruction were reported. This study was granted an exemption by the Oregon Health & Science University Intuitional Review Board because the study was determined not to involve human research.

Institutions

All US medical and pharmacy schools and colleges were invited to participate in a cross-sectional survey of the curricular coverage of FH-related content. Lists of schools and colleges were obtained from the Association of American Medical Colleges (www.aamc.org), American Association of Colleges of Pharmacy (www.aacp.org), and the American Association of Colleges of Osteopathic Medicine (www.aacom.org) Web sites. The survey was distributed to the most appropriate faculty member identified by an assistant or associate dean of academic, curricular, or student affairs in each of the schools and colleges. The phone calls to each institution were made by 3 of the investigators (B.W., J.C.W., and R.H.) using a preapproved script. The faculty's name, title, and e-mail were collected and recorded in a database. Once all contacts were identified, each was sent an e-mail inviting them to participate in the survey. The initial e-mail included a brief description of the study objectives and design, a link to the survey, and a deadline for completion. Reminder e-mails were sent every week to those who had not yet completed the survey during the 5-week period that the survey was open. The survey was voluntary for all participants, and their responses remained anonymous.

Data analysis

Descriptive statistics generated by the SurveyMonkey software were used to analyze the overall results. The Compare feature was used to compare the responses between medicine, pharmacy, and osteopathic medicine programs and verified using SigmaPlot for Windows version 11.0 (Systate Software, Inc, San Jose, CA).