Intra-rator variability of primary care physicians in management of hyperlipidaemia

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Summary

Background: **Recent studies support the link between hyperlipidaemia and increased prevalence of cardiovascular diseases (CVDs). In Saudi Arabia, CVDs became a serious problem following rapid urbanization. The health care system in Saudi Arabia makes the primary care accessible to all.**

Aim: **To assess the ability of primary care physicians to be consistent with themselves in the management of hyperlipidaemia.**

Design of the study: **Cross – sectional.**

Setting: **Family medicine department affiliated with tertiary hospital.**

Method: **Using 63 patient problem vignettes, each physician was asked, whether a patient required no treatment, dietary or drug treatment. Exact vignette cases were shown again to each physician two weeks later .The Kappa statistical test was used to measure the physician's intra-rator variability.**

Results: **Forty- Seven physicians were recruited to participate in this study. The Kappa statistics suggested an excellent intra-rator agreement by only four physicians, but a large majority, 28 physicians (62.2%) had fair to good agreement while thirteen physicians (28.9%) had poor agreement with themselves.**

Conclusion: **It is suggested that doctors must undergo adequate training and continuous evaluation of their skills in the management of hyperlipidaemia .Use of vignettes, might be a good method in assessing continuous medical education.**

Key words: *Hyperlipidaemia, Intra-rator variability, Primary care.*

Résumé

Introduction: Des études récentes soutienent un lien entre l'hyperlipidémie et une augmentation dans la fréquence des maladies cardiovasculaires (CVDs). En Arabie saoudite, CVDs étaient devenus un probleme grave à la suite d'une urbanization rapide. Le systeme des soins médicaux en Arabie saoudite permet à tout le monde d'avoir acces aux soins primaires.

But: Evaluer la compétance des médecins spéecialistes dans le domaine des soins primaires de faire preuve de cohérence en eux-même dans la prise en charge d'hyperlipidémie.

Plan d'étude: En coupe transversale.

Cadre: Département de la médicine de famille affilié à l'hôpital tertiaire.

Méthode: L'utilisation de vignettes des 63 cas des patients.

On a demandé à chaque médecin si un patient n'a pas besoin du traitement drogue ou regime alimentaire. Des cas exacts de la vignette ont été encore montrés à chaque médecin deux semaines plustard. L'examen statistique à travers Kappa était pour mésurer l'inconstance intra-rator de médecin.

Résultats: Quarante sept médecins ont été récrutés pour participer dans cet étude. Les statistiques à travers Kappa a suggére un accord intra-rator excellent par quatre médecins seulement, mais la plus grande partie, 28 médecins, soit 62,2% avaient de juste au bon accord tandis que trieze medecins soit 28,5% avaient mauvaise accord parmi eux-même.

Conclusion: On a suggéré que les docteurs, devront subir un formation appropriée et l'évaluation continue de leur connaissance dans la prise en charge d'hyperlipidémie, l'utilisation des vignettes, pourrait être une bonne méthode dans l'evaluation continue d'éducation médicale.

Introduction

The role of elevated lipid levels in Cardiovascular Diseases (CVDs) and stroke, the first and second leading cause of death worldwide, respectively is now well established and may even be under estimated.[1] Studies have demonstrated that lowering serum cholesterol levels reduce CVD events and total mortality.[2,3] However, clinical hyperlipidaemia is ill defined and to cope with this, many guidelines have been published.[4]

There has not been a true national study of hyperlipidemia in Saudi Arabia. However, individual researchers have reported varied levels of the prevalence of this condition. Al- Nuaim et al[5] reported that, the prevalence of high total cholesterol (>5.2 mmol/l) was 16 % and 19 % for male and female respectively in population over 15 years old. The authors attributed this relative low prevalence to the young status of the Saudi population, with 60% under 30 years old, 47 % less than 15 years and only four percent being 65 years or more. In a study by EL-Hazmi et al.[6] in 2001, over 9% of Saudi children below 15 years old and over 10% of those between 3-14 years of age had hyperlipidaemia.

The Kingdom of Saudi Arabia adopted the primary health care approach to achieve the health for all. Therefore, most patients have direct access to primary health care services. Studies have revealed high utilization of these public health services in both urban and rural areas.[7] The majority of the patients are managed at this level of care.[8] The need for the skill of hyperlipidaemia management has become an essential component of the health care in view of the increase in other risk factors of CVD (hypertension, diabetes, smoking, obesity and, lack of exercise) in the Saudi Arabian community.[9,10] It is therefore important that physicians in primary

care centers are aware and consistent with themselves in using the best approach in managing patients with hyperlipidaemia.

Several studies have been conducted to measure the intra-rator variability in other specialities like histopathology or radiology using slides and films however, little work have been conducted in clinical setting.[11,12]

Therefore, the aim of the present study is to assess the level of intra- rator variability in the management of hyperlipidaemia among primary care physicians.

Method

This is a prospective experimental study of primary care physicians, working in a family medicine department, affiliated with tertiary hospital, over a period of one month.

The study population was the primary care physicians, who were working in primary health care centers located under the Department of Family Medicine, King Fahad National Guard Hospital, Riyadh, in August 2000. All doctors were included in the study.Only physicians, who were on holidays or temporarily transferred from the department for the whole month of August, were excluded from the study.

Data collection procedures

All physicians were aware of general aims of the project but were not aware of the specific objectives of the study so as not to introduce potential bias. To maintain confidentiality, an identification number was allocated to each physician. A structured questionnaire containing the demographic and professional characteristics of the primary care physicians was designed for data collection.

The study was performed in two stages, using 63 patient vignettes; each was designed to contain some demographic data, medical history of a number of cardiovascular risk factors and lipid profile for a patient (Figure 1)

In stage 1: each physician was asked if a patient needed no treatment, dietary, or drug therapy on viewing each of the 63 patient vignettes. In stage 2: which was two weeks after the first run, the same 63 patient vignettes were shown again to the same physicians, with the same request.

Data management and statistical analysis

The data were collected and electronically coded into a computer using EPI INFO version 6.04 software.[13] The data check module in this program was further used to validate the accuracy of data entry before it was transferred into a format to allow the use of the SPSS software package for statistical analysis[14]. Initial data exploration and the frequency distribution of each variable were produced in tables and edited for range and consistency checks.

Kappa statistical ratio has been devised as an index of agreement for nominal scales which lacks a natural ordering for different kinds of agreement. It is defined as the proportion of agreement in excess of chance that is the ratio of observed agreement in excess of chance divided by the maximum possible agreement in excess of chance.[15]

The mathematical expression for Kappa is

$$K = \frac{Po - Pe}{1 - Pe}$$

Where   Po = observed agreement.

Pe= agreement expected by chance.

The used interpretations of k value are as follows:

Perfect agreement	=	1.0
Excellent agreement beyond chance	=	>0.75
Fair to good agreement beyond chance	=	0.4-0.75
Poor agreement beyond chance	=	<0.4
Chance agreement only	=	0

The distribution of the kappa statistic ratios, were examined for normality and homoscedacity, assumptions underlying the use of parametric tests. In situations where these assumptions were violated the non- parametric statistics - Kruskal-Wallis and Mann- Whitney U tests were used to test hypothesis when physicians were classified into three or more groups and two groups respectively, the analysis of variance technique was used when the classifying factor was more than two groups or the student's t tests when there were only two groups thus the hypothesis of no difference between the levels of the physician's demographic or professional characteristics, were investigated for statistical significance. The Chi square test was used to investigate the statistical significance of association between any two categorical or qualitative variables when data were expressed in contingency tables. All tests were carried out at the 5% level of probability significance.

Results

A total of 47 primary care physicians were recruited to participate in this study. Two of the physicians did not complete the second rating of the 63 vignettes .Thus, they were excluded from the statistical analysis, thereby given a response rate of 95.7%. Table1 shows the personal characteristics of the physicians.

There were no statistically significant effects of age, sex, nationality, highest qualification and years since graduation on the overall intra- rator agreement of the physicians when they reported the rating of the vignettes two weeks after the initial assessment (P > 0.05) Table2.

Kappa statistics suggested an excellent agreement in only four physicians and 28 physicians had fair to good agreement while 13 physicians had poor agreement Table 3.

Decisions about "Drug Therapy" indicate that six physicians had poor agreement, while, ten had excellent agreement and the remaining sizeable majority, 29 fair to good agreement. The median Kappa statistics of 0.67 showed the intra-rator variability in rating the vignettes for drug treatment was good.

The kappa statistics for "Diet Therapy" decision in Table 2 indicate more than 50 % had poor agreement. Excellent agreement was by four physicians while 18 had fair to good agreement. The median Kappa statistics of 0.39 also indicated poor agreement and two physicians had negative values of Kappa indicating a very poor agreement beyond chance.

The Kappa statistics of "NoTreatment" decision in column 3 Table 2 also showed the intra- rator agreement was poor with a median of 0.31,mean = 0.32, (SD = 0.31). The most

Table 1 The characteristics of the participating primary care physicians in the study by sex characteristics. Department of Family Medicine, King Fahad National Guard Hospital, Riyadh.

1. Age (years)	Sex				Total (%)	
Sample	Male		Female		45	(100)
25-29	3	(9.10)	1	(8.33)	4	(8.90)
30-34	5	(15.2)	3	(25.0)	8	(17.8)
35-39	4	(12.1)	3	(25.0)	7	(15.6)
40-44	8	(24.2)	4	(33.33)	12	(26.7)
45-49	10	(30.3)	1	(8.33)	11	(24.4)
50+	3	(9.10)	0		3	(6.70)
Mean (SD)	40.3 yrs.($\pm$7.5)		37.3 yrs.($\pm$5.1)		39.5 yrs. ($\pm$7.1)	
1-4	4	(12.1)	1	(8.30)	5	(11.1)
5-9	5	(15.2)	2	(6.70)	7	(15.6)
10-14	4	(12.1)	3	(25.0)	7	(15.6)
15-19	8	(24.2)	3	(41.7)	13	(28.9)
20-24	8	(24.2)	1	(8.30)	9	(20.0)
25+	4	(12.1)	0		4	(8.90)
Mean (SD	15.7 yrs (8.23)		3.2(5.30)		15.0 years (7.5)	
3. Nationality						
Saudi	9	(27.3)	2.	(16.7)	11	(24.4)
Non-Saudi	24	(72.3)	10	(83.3)	34	(75.6)
4. Qualification						
MBBS	7	(21.2)	8	(66.7)	15	(33.3)
Saudi Board	8	(24.2)	1	(8.33)	9	(20.0)
Others	18	(54.5)	3	(25.0)	21	(45.7)
Total	33	(100)	12	(100)	45 (100)	

SD = Standard deviation.

Table 2 The summary statistics of kappa ratio for intra - rator between levels of primary care physicians' demographic and professional characteristics. Department of Family Medicine, King Fahad National Guard Hospital, Riyadh.

Characteristics	N	Mean	SD	F-value / t	P-value
1. Age					
25-34	12	0.45	0.25		
35-44	19	0.54	0.25	0.310	0.735
45+	14	0.48	0.19		
2. Sex					
Male	33	0.48	0.24	1.499	0.151
Female	12	0.59	0.18		
3. Nationality					
Saudi	11	0.49	0.26	-0.263	0.794
Non- Saudi	34	0.51	0.21		
4. Highest Qualification					
MBBS	15	0.50	0.24	1.339	0.273
Board	9	0.60	0.21		
Others	21	0.47	0.22		
5. Years since graduation					
< 10 years	12	0.47	0.24	0.696	0.504
10-19 years	20	0.48	0.27		
20 years +	13	0.57	0.13		

SD = Standard Deviation

N= Number

common value of kappa statistics was zero and 24 physicians (53.3%) were with poor agreement but five physicians had excellent agreement and another five had negative Kappa value indicating very poor agreement.

Table 3. The Intra-rator variability of primary care physicians in Management of hyperlipidaemia as assessed by Kappa statistics. Department of Family Medicine, King Fahad National Guard Hospital, Riyadh.

Kappa	Intra- rator agreement							
Statistics	Drug		Diet		No Treatment		Overall	
	N	(%)	N	(%)	N	(%)	N	(%)
<0.4	6	(13.3)	23	(51.1)	24	(53.3)	13	(28.9)
0.4-0.75	29	(64.4)	18	(40.0)	16	(35.6)	28	(62.2)
>0.75	10	(22.2)	4	(8.90)	5	(11.1)	4	(8.90)
Kappa Summary Statistics								
Mean	0.60		0.41		0.32		0.51	
Median	0.67		0.39		0.30		0.52	
Mode	0.50		0.30		0.00		0.48	
SD	0.22		0.25		0.31		0.23	
Range	0.09-0.93		(-0.15,0.90)		(-0.9,93)		(0.04,0.93)	

SD = standard Deviation
N = Number

M.R.N: (00001)
Patient Name:

Order Location:

Laboratory Report – Outpatient

Chemistry

Procedure	Results	Ref. Range	Units
Cholesterol	4.88	[3.10-5.20]	mmol/l
Triglycerides	1.57	[0.34-1.81]	mmol/l
High density lipoprotein	0.41	[1.01-2.49]	mmol/l
Low density lipoprotein	3.76	[1.68-4.53]	mmol/l

Patient's Age (yrs): 57
Sex: Female
Risk Factors: 1.   Diabetes mellitus
                        2.   Smoking
                        3.
                        4.
                        5.
                        6.

Management: (Please enter a number)
            1. No treatment

            2. Diet

            3. Drug

Fig. 1 *A Case Vignette Sample of the 63 clinical vignettes shown to the physicians in each stage of the study.*

Discussion

Guidelines have been shown to change clinical practice and improve patient outcome.[16] However, the findings in this study indicate that about one third of the physicians were not consistently adhered with themselves, which means that they might not be following any particular guidelines in their management of hyperlipidaemia

Unlike the majority of previous studies that used chart review to measure adherence to guidelines,[17,18] vignettes were used in this study. This has the advantages that the exact

vignette cases have been seen by different physicians or same physician in the two stages of the study at two weeks apart which might not occur in real patient practice to measure intra- rator variability .However, in this study, we have some limitations; the study situation may have led the physicians to pay more attention to the management of hyperlipidaemia than usual. On the other hand, knowing these were not real patients, the physicians may have less care than usual. Nevertheless, the fact remains that procedures would reflect the understanding and adherence of the primary care physicians to guidelines in the management of hyperlipidaemia.The study found that more than two thirds of the physicians have an adequate intra-rator agreement. This is not surprising because different doctors may follow different guidelines. However, they should at least be consistent with themselves in their management of the vignettes when repeated two weeks later.

The physicians' characteristics did not show any significant relationship with the intra rator agreement. The fact that there is no sex differential is not surprising, as males and females must have been exposed to similar training wherever they come from. However, females appear to have a better agreement as well as those with Saudi Board equivalent qualifications and those with long years of experience (beyond 20 years). However, the differences did not reach the 5 % level of statistical significance as shown by the Kruskal- Wallis test for age, highest qualification, and years of experience since graduation and Mann Whitney U- test for testing sex and nationality differentials

Although this study was not designed to provide an explanation for the under- use of these guidelines, understanding the possible reasons is essential in order to promote good practice in the treatment and prevention of CHD. They may include lack of awareness of the guidelines, mixed messages from different guidelines or disagreement with the guidelines due to lack of opportunity to evaluate and adopt guidelines critically to local practice.[19] There are also barriers to the implementation of good treatment guidelines, such as the cost of the treatment over which individual physicians have little control and the restriction on lipid modifying drug prescriptions. It has been found that guidelines are more likely to succeed if those who will be using them develop them.[20] Adherence to guidelines is also facilitated if the pathway or chart forms part of the patients' record and is available for review when clinical decisions are being made.[21] Lipid clinic demonstrated an improved standard of care that comes closer to achieving the guidelines.[22] Professional educational programs such as Lipid Disorders Training Program (LDTP) may improve physician's performance.[23] and providing computer technology can make the medical information easily accessible.[24]

In conclusion, around two thirds of primary care physicians are consistent with themselves on some form of guidelines. Approximately, one third of the doctors in the unit have inadequate consistency with themselves in the management of hyperlipidaemia. This is the group, which most probably do not have any guidelines to follow in making decision in the management of hyperlipidaemia. All health care systems should indicate one guideline to be used by the department

as the standard for their unit, in which all doctors should have additional training. Follow up audit of compliance after adequate training and certification of successful physicians for prescription of lipid lowering drugs is recommended. A concise version of the guidelines should be made available when clinical decisions are being taken e.g. by making it a part of the patients' medical record. To assess the effectiveness of Continuous Medical Education (CME) in this area, this method of utilizing vignettes is recommended. Further studies are needed to explore what type of guidelines is applied with the primary care physicians.

Acknowledgment

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