Evolution of Cardiovascular Risk Indicators in Elderly Hypertensive Men from a Health Facility in North Lima

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A R T I C L E  I N F O

Article history:
Received: 04 January, 2021
Accepted: 04 February, 2021
Online: 16 February, 2021

Keywords:
Evolution
Hypertension
Seniors
Healthy habit

A B S T R A C T

Cardiovascular risk today is one of the non-communicable diseases that occurs in the population of the third age where risk factors further compromise its health, therefore the objective of the study is to determine the evolution of the Cardiovascular Risk indicators in hypertensive elderly from a facility in North Lima. This is a quantitative, non-experimental, descriptive, and cross-sectional study, with a population of 47 hypertensive elderly people over 60 years of age, whose cardiovascular risk was determined with the PAHO cardiovascular risk calculator. In the results, we can see that in the month of January, 17 (36.2%) presented a moderate risk, 19 (40.4%) presented high risk, 8 (17%) presented very high risk and 3 (6.4 %) presented critical risk, in June, 17 (36.2%) presented low risk, 24 (51.1%) presented moderate risk, 4 (8.5%) presented high risk, 2 (2.1 %) presented very high risk and 1 (2.1%) presented critical risk and in December, 25 (53.2%) presented low risk, 17 (36.2%) presented moderate risk, 4 (8.5%) presented high risk and 1 (2.1%) presented critical risk. In conclusion, prevention of cardiovascular problems in the elderly should be expanded, to contribute to their health status and quality of life due to the increase in population.

1. Introduction

Cardiovascular risk is the probability that the individual presents cardiac problems in a certain time, and this will depend fundamentally on factors that predispose the individual’s risk, these factors can be modifiable and non-modifiable, whose function varies in relation to the present risk, which can be qualitatively (high, intermediate or low) or quantitatively (numerical probability of suffering a complication in a given period) [1].

In the world, aging worldwide is increasingly accelerated, whereas in 2015 the amount of the population of older adults in the world has doubled, going from 12% to 22%, it is also underestimated that within 2 years the number of the age group of the elderly will be higher than children under 5 years of age. Likewise, in the near future, the majority of older adults will be concentrated in countries with low to middle income [2], therefore it should be taken into account that the aging process is usually accompanied by chronic diseases, among which stand out heart disease [3].

Worldwide, cardiovascular diseases (CVD) are responsible for approximately 17 million deaths per year, among them complications from high blood pressure produce 9.4 million deaths annually. The worldwide prevalence of hypertension (HT) is estimated to be 35% [4]. For its part, the Pan American Health Organization (PAHO) estimates that hypertension affects between 20-40% of the adult population in the Americas. At the Peruvian level, 16.5% are affected [5]. Focusing on the elderly, HT affects 67% of those over 60 years of age in the United States and in Peru the prevalence is 43.3% in those over 60 years of age. The foregoing shows that hypertension is a growing public health problem, in the context of epidemiological transition that the country is going through [6].

In a study carried out in Peru [7], they observed that in patients older than 80 years of age with a history of HT, the main risk factors were that 10.07% of older adults were smokers and it was more frequent in men. As for women, 33% had high cholesterol in both sexes, diabetes mellitus in 16.63% and 14.29% were obese, these last two risk factors were seen more in women than men.

In a study carried out in Brazil [8], they showed in their results cardiovascular factors in patients older than 60 years in relation to the cardiovascular disease they suffered and their lifestyle habits, where 53% had high blood pressure, 25% diabetes mellitus and 8% already suffered from a cardiovascular disease,
in relation to their life habits, 68% of older adults carried out physical activity, 35% were alcoholics and 50% were smokers, therefore risk factors such as alcoholism and smoking occurred more in men than women, and therefore cardiovascular diseases appeared early in men.

In a study carried out in Brazil [9], they observed in their results that 64.9% of adults older than 60 years with a history of arterial hypertension were obese, also it was found that 70.8% of older adults had a metabolic syndrome, 27.2% had a low cardiovascular risk, 46.8% moderate and 26% high, interpreting that older adults who presented metabolic syndrome had a high probability of having a high cardiovascular risk.

The present study is important because it will provide relevant and real data about the cardiovascular risks of hypertensive elderly people since the elderly makes them more vulnerable to contracting metabolic and cardiovascular diseases.

2. Methodology

It is an applicative study where the evolution of cardiovascular risk indicators in hypertensive older adults will be detailed, also 3 measurements will be given in their assessment in the months of January, June, and December, to analyze the evolution and observe if hypertensive older adults present cardiovascular risk factors.

2.1. Research type and Design

The present study, due to its characteristics, way of collecting data and measuring the variables involved, has a quantitative approach. Regarding the methodological design, it is a non-experimental, descriptive, cross-sectional study [10].

2.2. Population

In the present study, the population is made up of 47 hypertensive elderly men over 60 years of age who attend a health facility in North Lima.

2.3. Inclusion Criteria

- Older adult patients suffering from arterial hypertension
- Patients who attend at least 3 check-ups at the health facility.
- Older adult patients who have signed the informed consent according to the principles of ethics of charity, non-maleficence, justice, and autonomy.

2.4. Technique and Instrument

To carry out this research work, the Cardiovascular Risk Calculator of the Pan American Health Organization (PAHO) was used, which aims to determine the risk in the elderly, this instrument was used because the study was exploratory and only required the use of the PAHO Calculator. The Cardiovascular Risk Calculator is administered to assess whether the patient has a cardiovascular risk, this calculator will determine the risk depending on sex, age, blood pressure, history of diabetes mellitus, cholesterol and risk factors such as smoking, in this way it is determined whether the patient is at low, moderate, high, very high, and critical risk; when calculating the parameters, it is estimated that there may be a risk of presenting some cardiovascular disease - to establish the values, the incidence of less than 10% at 10 years is considered low risk, that is, less than 1% per year. Another way to read it is to consider that of a group of 100 people in this situation, one will develop a disease each year, thus reaching 10 people in a decade. At the other extreme, very high risk greater than 40% at 10 years, indicates that of 100 people in this condition, 4 will have events annually and 40 will have them in the next 10 years; almost one in two [11].

The Calculator is more accurate if cholesterol levels are reported, although it may not be considered if the data is not reported. Once the risk estimate has been obtained, it can be evaluated to what extent the risk could be modified by correcting factors such as smoking, high blood pressure and hypercholesterolemia. It is considered ideal not to smoke, blood pressure values less than 140/90 mmHg and total cholesterol less than 200 mg / dl. In some cases, it is possible that the desired cholesterol may be much lower than that, depending on the presence of other risk factors. In such a way that the person may notice that when they quit smoking their risk drops by half, or that it transforms from very high to low by correcting the three factors that we can influence in this calculator. Age and gender cannot be changed, and diabetes status is taken upon knowledge of its diagnosis but is not based on blood glucose levels or other parameters.

It refers to low risk to carry out all its preventive control activities; moderate risk when it performs its controls but not daily; high risk, when the patient barely performs its preventive controls; very high risk when the patient scarcely performs its preventive controls and presents symptoms product of the disease; and critical risk when the patient does not perform any preventive control and the symptoms present to the disease tend to complicate.

2.5. Place and Application of the Instrument

To carry out the Development of the cardiovascular risk calculator in hypertensive elderly patients, it was carried out in a Health Facility in North Lima.

First, the permits were coordinated with the head of the establishment to carry out the research, then the permission to the patient explaining about what was going to be developed and why the research work will be carried out.

It was developed during the mornings with an approximate time of 10 minutes for each elderly hypertensive patient, concluding a good satisfaction since they supported the research work.

It is important to emphasize the presence of health personnel during the development of the research work, because the patient as an older adult with hypertension there is the possibility that signs, and symptoms of the disease may occur and thus the necessary treatment can be administered to be able to stabilize it.

3. Results

The results of hypertensive elderly patients corresponding to the research work will be shown below:
Figure 1 shows the six-monthly comparison of the evolution of cardiovascular risk indicators in hypertensive elderly people from a health facility in North Lima, where in January, 17 (36.2%) presented a moderate risk, 19 (40.4%) presented high risk, 8 (17%) presented very high risk and 3 (6.4%) presented critical risk, in June, 17 (36.2%) presented low risk, 24 (51.1%) presented moderate risk, 4 (8.5%) presented high risk, 2 (2.1%) presented very high risk and 1 (2.1%) presented critical risk and in the month of December, 25 (53.2%) presented low risk, 17 (36.2%) presented moderate risk, 4 (8.5%) presented high risk and 1 ((2.1%) presented critical risk.

In Table 1, it is observed that in moderate cardiovascular risk, within the hypertensive elderly population, 17 (100%) do low physical activity, at high cardiovascular risk, 9 (47.4%) do low physical activity and 10 (52.6%) do not do physical activity, at very high cardiovascular risk, 3 (75%) do not do physical activity and 5 (25%) do not do physical activity, and at critical risk 3 (100%) do not do physical activity, in relation to weight, the hypertensive elderly had a weight between 70 kg and 99 kg respectively with a height of 155 cm to 171 cm, taking their BMI where the low cardiovascular risk 6 (35.3%) were within the normal range, 10 (58.8%) were overweight and 1 (5.9%) was obese, at moderate cardiovascular risk, 1 (4.2%) is within the normal range and 23 (95.8%) were overweight, at high cardiovascular risk, 4 (100%) were obese, at very high cardiovascular risk 1 (100%) was obese and at critical cardiovascular risk 1 (100%) was obese, in relation to smoking, at low cardiovascular risk 1 (5.9%) was a smoker and 16 (94.1%) were non-smokers, at moderate cardiovascular risk 13 (54.2%) were smokers and 11 (45.8%) were non-smokers, at high cardiovascular risk 1 (25%) was a smoker and 3 (75%) were not smokers, at very high cardiovascular risk 1 (100%) was a smoker and at critical cardiovascular risk 1 (100%) was a smoker, in relation to blood pressure, at low cardiovascular risk 12 (70.6 %) suffer from diabetes and 5 (29.4) do not have diabetes, at moderate cardiovascular risk 21 (87.5%) have diabetes and 3 (12.5) do not have diabetes, at high cardiovascular risk 4 (100 %) suffer from diabetes mellitus, at very high cardiovascular risk 1 (100%) suffers from diabetes and at critical cardiovascular risk 1 (100%) suffers from diabetes, in relation to blood pressure in hypertensive elderly, they had a blood pressure between 112 mmHg to 155 mmHG and lastly, in relation to cholesterol, the hypertensive elderly had a cholesterol level between 180 mg/dl and 300 mg/dl.

In Table 2, it is observed that in low cardiovascular risk within the hypertensive elderly population, 14 (82.4%) do medium physical activity, 3 (17.6%) do low physical activity, and moderate cardiovascular risk 2 (8.3%) do medium physical activity and 22 (91.7%) do low physical activity, at high cardiovascular risk 2 (50%) do low physical activity and 2 (50%) do not do physical activity, in very high cardiovascular risk 1 (100%) does not do physical activity and in critical cardiovascular risk 1 (100%) does not do physical activity, in relation to weight, hypertensive elderly had a weight between 60 kg and 91 kg respectively with a height from 155 cm to 171 cm, taking their BMI where the low cardiovascular risk 6 (35.3%) were within the normal range, 10 (58.8%) were overweight and 1 (5.9%) was obese, at moderate cardiovascular risk, 1 (4.2%) is within the normal range and 23 (95.8%) were overweight, at high cardiovascular risk, 4 (100%) were obese, at very high cardiovascular risk 1 (100%) was obese and at critical cardiovascular risk 1 (100%) was obese, in relation to smoking, at low cardiovascular risk 1 (5.9%) was a smoker and 16 (94.1%) were non-smokers, at moderate cardiovascular risk 13 (54.2%) were smokers and 11 (45.8%) were non-smokers, at high cardiovascular risk 1 (25%) was a smoker and 3 (75%) were not smokers, at very high cardiovascular risk 1 (100%) was a smoker and at critical cardiovascular risk 1 (100%) was a smoker, in relation to blood pressure, at low cardiovascular risk 12 (70.6 %) suffer from diabetes and 5 (29.4) do not have diabetes, at moderate cardiovascular risk 21 (87.5%) have diabetes and 3 (12.5) do not have diabetes, at high cardiovascular risk 4 (100 %) suffer from diabetes mellitus, at very high cardiovascular risk 1 (100%) suffers from diabetes and at critical cardiovascular risk 1 (100%) suffers from diabetes, in relation to blood pressure in hypertensive elderly, they had a blood pressure between 112 mmHg to 155 mmHG, and lastly, in relation to cholesterol in the hypertensive elderly, they presented a cholesterol level between 178 mg/dl to 285 mg/dl.
Table 1: Cardiovascular Risk in Hypertensive elderly in relation to Risk Factors for the Month of January of a Health Facility in North Lima

<table>
<thead>
<tr>
<th>Cardiovascular risk</th>
<th>Physical Activity</th>
<th>Weight (KG)</th>
<th>Height (cm)</th>
<th>Body Mass Index (BMI)</th>
<th>Smoking</th>
<th>Diabetes</th>
<th>Maximum Systolic Pressure (mmHg)</th>
<th>Cholesterol</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Low</td>
<td>Do not</td>
<td></td>
<td>Overweight</td>
<td>Obese</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Low risk</td>
<td>-</td>
<td>17 (100%)</td>
<td>0</td>
<td>≥70KG</td>
<td>17 (100%)</td>
<td>0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Moderate risk</td>
<td></td>
<td>10 (52,6%)</td>
<td>9 (47,4%)</td>
<td>≤99KG</td>
<td>19 (100%)</td>
<td>12 (63,2%)</td>
<td>7</td>
<td>37,5</td>
</tr>
<tr>
<td>High risk</td>
<td></td>
<td>3 (37,5%)</td>
<td>5 (62,5%)</td>
<td>≤171 cm</td>
<td>3 (37,5%)</td>
<td>5 (62,5%)</td>
<td>3</td>
<td>93,6</td>
</tr>
<tr>
<td>Very high risk</td>
<td></td>
<td>0 (100%)</td>
<td>0</td>
<td>≤155 cm</td>
<td>0 (100%)</td>
<td>0 (100%)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Critical risk</td>
<td></td>
<td>0 (100%)</td>
<td>0</td>
<td>≥155 cm</td>
<td>0 (100%)</td>
<td>0 (100%)</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 2: Cardiovascular Risk in Hypertensive Elderly in relation to Risk Factors for the Month of June in a Health Facility in North Lima

<table>
<thead>
<tr>
<th>Cardiovascular risk</th>
<th>Physical Activity</th>
<th>Weight (KG)</th>
<th>Height (cm)</th>
<th>Body Mass Index (BMI)</th>
<th>Smoking</th>
<th>Diabetes</th>
<th>Maximum Systolic Pressure (mmHg)</th>
<th>Cholesterol</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Medium</td>
<td>Low</td>
<td>Do not</td>
<td>Overweight</td>
<td>Obese</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Low risk</td>
<td></td>
<td>14 (82,4%)</td>
<td>3 (17,6%)</td>
<td>-</td>
<td>6 (35,3)</td>
<td>10 (58,8)</td>
<td>1</td>
<td>5,9</td>
</tr>
<tr>
<td>Moderate risk</td>
<td></td>
<td>2 (8,3%)</td>
<td>22 (91,7%)</td>
<td>-</td>
<td>1 (4,2)</td>
<td>23 (95,8)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>High risk</td>
<td></td>
<td>0 (50%)</td>
<td>2 (50%)</td>
<td>≥155 cm</td>
<td>0 (100)</td>
<td>0 (100)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Very high risk</td>
<td></td>
<td>0 (100%)</td>
<td>1 (100%)</td>
<td>≥112 cm</td>
<td>0 (100)</td>
<td>1 (100)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Critical risk</td>
<td></td>
<td>0 (100%)</td>
<td>1 (100%)</td>
<td>≥112 cm</td>
<td>0 (100)</td>
<td>1 (100)</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 3: Cardiovascular risk in hypertensive elderly in relation to risk factors for the month of December in a health facility in north lima

<table>
<thead>
<tr>
<th>Cardiovascular risk</th>
<th>Physical Activity</th>
<th>Weight (KG)</th>
<th>Height (cm)</th>
<th>Body Mass Index (BMI)</th>
<th>Smoking</th>
<th>Diabetes</th>
<th>Maximum Systolic Pressure (mmHg)</th>
<th>Cholesterol</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Medium</td>
<td>Low</td>
<td>Do not</td>
<td>Overweight</td>
<td>Obese</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Low risk</td>
<td></td>
<td>23 (92%)</td>
<td>2 (8%)</td>
<td>-</td>
<td>22 (88%)</td>
<td>2 (8%)</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>Moderate risk</td>
<td></td>
<td>6 (35,3%)</td>
<td>11 (64,7%)</td>
<td>0</td>
<td>1 (5,9)</td>
<td>16 (94,1)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>High risk</td>
<td></td>
<td>0 (75%)</td>
<td>3 (25%)</td>
<td>≥55 Kg</td>
<td>0 (25%)</td>
<td>3 (75%)</td>
<td>4</td>
<td>100%</td>
</tr>
</tbody>
</table>

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In Table 1, it is observed that in low cardiovascular risk, within the hypertensive elderly population, 23 (92%) do medium physical activity and 2 (8%) do low physical activity, in moderate cardiovascular risk 6 (35.3%) do medium physical activity and 11 (64.7%) do low physical activity, at high cardiovascular risk, 3 (75%) do low physical activity and 1 (25%) do not perform physical activity, at risk Critical cardiovascular 1 (100%) do low physical activity, in relation to weight, hypertensive elderly had a weight between 55 kg to 92 kg respectively with a height of 155 cm to 171 cm, taking their BMI where in low cardiovascular risk, 22 (88%) are within the normal range, 2 (8%) were overweight and 1 (4%) was obese, at moderate cardiovascular risk, 1 (5.9%) is within the normal range and 16 (94.1%) were overweight, at high cardiovascular risk, 1 (25%) was overweight and 3 (75%) were obese, at critical cardiovascular risk 1 (100%) was obese, in relation to smoking, at low cardiovascular risk 2 (8%) were smokers and 23 (92%) were non-smokers, at moderate cardiovascular risk 11 (64.7%) were smokers and 6 (35.3%) were not smokers, at high cardiovascular risk 4 (100%) were smokers and at critical cardiovascular risk 1 (100%) was a smoker, in relation to cardiovascular risk and diabetes mellitus, at low cardiovascular risk, 18 (72%) suffered from diabetes and 7 (28%) do not suffer from diabetes, at moderate cardiovascular risk 17 (100%) have diabetes, at high cardiovascular risk, 3 (75%) have diabetes and 1 (25%) does not have diabetes, at cardiovascular risk Critical 1 (100%) suffers from diabetes, in relation to blood pressure in hypertensive elderly, they had a blood pressure between 100 mmHg to 150 mmHg and lastly in relation to cholesterol in hypertensive elderly, they had a cholesterol level between 160mg/dl to 265mg/dl.

Among the results obtained, it is important to consider the months of difference in which it will allow us if hypertensive elderly people can reduce cardiovascular risk by performing physical activities such as passive exercises, walks, yoga, muscle stretching, and the communication with the family as it will allow to see if have any symptoms that decrease their health well-being.

4. Discussion

In this research work, an approach is given to the public health of hypertensive elderly people in a health facility, where factors and conditioning factors in them, such as the elderly population, increase the probabilities of having cardiovascular risks.

In the results on the cardiovascular risks distributed every six months in the months of January, June, and December, we can verify that in the initial month of January, the patients presented a high cardiovascular risk, this is because as adults of the third age, because of their gender male, increases the chances of suffering some type of cardiovascular risk. In [8], they argued that life habits in the elderly population related to cardiovascular risk are influenced by sociodemographic and clinical factors, where sex, smoking and alcoholism; the presence of diabetes mellitus and arterial hypertension were more associated with the patient's desire to be able to control the disease and the alteration of blood pressure, where they do physical activities and control their own disease. Likewise, in [12], they argued that arterial hypertension is a cardiovascular risk factor with the greatest burden in the male population, therefore, with regard to chronic diseases, it is associated with diseases such as cardiovascular mortality and ischemic heart disease that can compromise the individual's health.

In the same way, the factors that put the health of hypertensive elderly at risk make available the probabilities that they suffer from heart disease or even die as a result. In [7], the authors mentioned that risk factors such as high blood pressure, smoking, diabetes, overweight or obesity and physical inactivity, are factors that compromise the elderly to be vulnerable and increase the chances of dying from heart disease. Likewise, in [13], the authors argued that older adults with cardiovascular risk factors are more associated with suffering an acute myocardial infarction since sedentary lifestyle and arterial hypertension can happen.

For this reason, physical activity, a healthy diet, not consuming products that compromise your health, allow the elderly to have a better quality of life, a good life expectancy, all of which will allow the elderly to improve and live a life healthy. In the same way, in [14], the authors maintain that a change in lifestyle, regular physical activity, having a balanced diet, will allow the elderly to improve their quality of life. In [15], the authors argued that a good quality of life in the elderly is due to the fact that the level of physical activity is associated with a lower prevalence of presenting a cardiovascular risk factor. In [16], the authors mentioned in their systematic review that increasing the level of physical activity, balancing the diet, and eliminating tobacco and alcohol habits allows older adults to improve their quality of life.

For all this to be carried out, a plan is needed that allows it to be put into practice in the elderly to maintain a healthy life and that cardiovascular risks can be prevented. For this, 4 steps have been carried out as a plan to prevent cardiovascular risks:

- Reduction or elimination of tobacco consumption: Quitting smoking and not using smokeless tobacco is one of the best options for the heart, since the chemical substances in tobacco damage the heart and blood vessels reducing oxygen in the blood, thereby increasing blood pressure and the heart must work more than it does usually. Although the cardiovascular risk decreases in the person one day after they stop smoking, so if after a year without tobacco, it will decrease half the risk of a smoker.

- Daily physical activity: In the elderly, regular physical activity is important since it allows them to reduce cardiovascular risk, since it allows weight control, and reduces other conditions
such as high blood pressure, high cholesterol, and type 2 diabetes mellitus; so, they should do aerobic exercises a week, and activities that strengthen their muscles, since these activities offer benefits for the heart.

- Healthy Eating: A balanced diet helps protect the heart, prevents high blood pressure, cholesterol and reduces the risk of contracting type 2 diabetes mellitus, limiting the intake of salt, sugar, carbohydrates, alcohol, and saturated fat, all of which will allow them to have a good health.

- Maintain a healthy weight: For one to have a healthy lifestyle, one must perform physical activities along with a healthy diet, since physical activity helps maintain weight, lowers high blood pressure, reduces the risks of type 2 diabetes, among other risks All this with a healthy diet that is low in calories, and more nutritious, allows their weight to be preserved and stay healthy.

5. Conclusions

It is concluded that primary prevention strategies should be considered in elderly patients with high cardiovascular risk and have secondary prevention

It is concluded that prevention of cardiovascular problems should be expanded in the elderly, to contribute to their health and quality of life due to the increase in the population.

It is required to provide counseling on food and nutrition that motivates the elderly and their family to learn about the benefits of a healthy diet.

It is concluded that an adequate diagnosis and control of risky diseases must be carried out, especially acting on the risk factors identified at an early age, to achieve a better quality of life when one is an older adult.

The limitation of this research work is due to the situation due to the COVID-19 pandemic that could not take more elderly patients for the study, since the population depended only on one health center, so it was taken only 47 elderly patients who were the most recent to their controls in the same. 

Conflicts of Interest
The authors declare that they have no conflict of interest.

References