

between stents, and confirmed correct stent position during release.

This observational register has several limitations. Angiographic follow-up was carried out only in patients with suspected SR based on clinical symptoms compatible with this diagnosis or ischemia observed in noninvasive tests. Intravascular ultrasound or optical coherence tomography was used in half the patients, and thus the number of undiagnosed SF could have been even higher. Furthermore, optical coherence tomography is still used infrequently, although its imaging resolution is better able to identify struts than intravascular ultrasound.

In conclusion, SF diagnosis using intravascular imaging techniques is extremely accurate and is superior to diagnosis by radiologic imaging alone. This finding has prognostic implications, because SF increases the risk of SR and thrombosis. Some sirolimus-eluting DES (Cypher®) have a higher incidence of SF than other DES.

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Emotional Regulation and Heart Rate Variability in Healthy Male Managers

Regulación emocional y variabilidad de la frecuencia cardiaca en directivos varones sanos

To the Editor,

Cardiovascular diseases are the main cause of death in Spain, and numerous preventative policies are currently being applied all around the world.¹ Analysis of heart rate variability (HRV) is a reliable means of evaluating health, because low values are directly related to age, an increased incidence of cardiovascular disease, and mortality.

Variables such as optimism and positive emotionality favor cardiovascular health in adults. In contrast, poor control of negative emotions predicts the appearance of cardiovascular disease.² Emotional regulation (ER) is a central skill in emotional intelligence, defined as an individual's ability to regulate his or her emotions and those of others to foster emotional and intellectual growth. This skill facilitates the development of strategies that are effective in reducing the impact of negative emotions. Hence, it functions as a protector against challenging situations and even produces more adaptive physiological responses.³

Managers assigned high levels of responsibility, especially male managers in Spain, are exposed to continual professional demands that can cause psychological burnout and clinical symptoms. The objective of the present study was to determine whether ER is related to a reliable HRV indicator such as the low frequency/high frequency (LF/HF) ratio and whether ER moderates the negative effect of age on managers' HRV.

The sample included 101 Spanish managers aged between 30 and 63 years (mean, 43.15 [6.90] years) holding managerial positions in private companies, randomly selected during a team-building course. The course was financed by the company, and was attended voluntarily. Managers with cardiovascular disease and/or

electrocardiographic abnormalities were excluded and therefore all participants were healthy and all gave their consent to being included in this study. We assessed self-perception of ER skills using items taken from the Spanish version of the Trait Meta-Mood Scale,⁴ the most frequently used, Spanish-language, self-report emotional intelligence scale, which has an alpha reliability coefficient of 0.86. This scale correlates with multiple criterion variables and demonstrates adequate test-retest reliability in the Spanish population.⁴ ER levels in our sample ranged from 14 to 40 points (29.35 [5.66]). HRV was determined with a Polar chest band linked to a Promis Body Monitor signal analysis unit, following established short-duration measure standards. The parameter used in this study was the LF/HF ratio, an index that relates low with high frequencies and has a negative association with HRV, ie, the higher the LF/HF ratio, the lower the HRV, and vice versa.⁵ The LF/HF values in the sample ranged from 0.5 to 5.5 (1.20 [0.91]). As covariable, we included perceived stress measured with the Spanish version of the Perceived Stress Scale. In addition, a specialist physician assessed smoking habits, alcohol intake, physical activity and body mass index. Levels of perceived stress ranged from 0 to 27 points (13.50 [5.59] points); the mean values for alcohol intake and the number of cigarettes smoked per day were 0.64 (0.48) L and 4.56 (10.22) cigarettes, respectively. Physical activity was classified as sedentary (0 h/week), light (1-3 h/week) and moderate (>3 h/week), with 45%, 36%, and 19% of managers, respectively, in each category. Body mass index ranged from 22.09 to 39.63 (27.11 [3.30]).

As a function of ER level, managers were divided into 3 groups following the recommendations established by the authors⁴: low (8-24), middle (24-35), and high (35-40). We also divided the sample into 2 groups by median age ≤ 41 and > 41 years. We performed ANCOVA analysis to examine the effect of low, middle and high ER and the 2 age groups on the LF/HF indicator. Analyses were adjusted for perceived stress level, alcohol and tobacco consumption, physical activity, and body mass index, which were included as control covariables on the

Table

Main Effect of Emotional Regulation and Age on the Low Frequency/High Frequency Heart Rate Variability Indicator

LF/HF (n=101)		
	Mean ± SD (95%CI)	Difference between means (95%CI)
<i>Emotional regulation</i>		
Low	2.02±0.29 (1.44-2.60)	
Middle	1.16±0.11 (0.94-1.37)	0.86 ^a (0.24-1.49)
High	1.02±0.29 (0.44-1.60)	1.00 ^b (0.18-1.81)
<i>Age</i>		
≤41 years	0.97±0.21 (0.56-1.40)	
>41 years	1.82±0.19 (1.44-2.20)	0.85 ^b (0.29-1.41)

95%CI, 95% confidence interval; LF/HF, low frequency/high frequency; SD, standard deviation.

The differences between means in emotional regulation take low emotional regulation as the point of comparison. The results are adjusted for perceived stress and healthy lifestyle habits (alcohol, tobacco, physical activity, and body mass index).

^a $P < .01$.

^b $P < .05$.

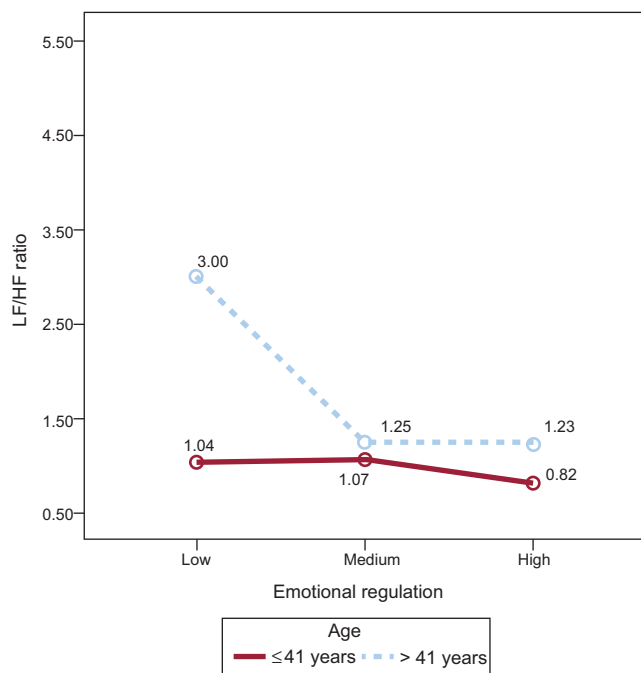


Figure. Effect of the interaction between levels of emotional regulation and age on the low frequency/high frequency heart rate variability indicator. Results adjusted for perceived stress and healthy lifestyle habits (alcohol, tobacco, physical activity and body mass index). LF/HF, low frequency/high frequency.

basis of evidence from previous studies.⁶ The Table shows the results of ANCOVA analysis in which we first obtained a main effect of ER on the LF/HF indicator ($P = .02$; partial $\eta^2 = 0.09$), and then a principle effect of age on LF/HF values ($P < .01$; partial $\eta^2 = 0.10$). The

Figure shows the effect of the interaction between age and ER levels on LF/HF ($P = .02$; partial $\eta^2 = 0.09$). Managers with low ER and aged over 41 years showed a statistically higher LF/HF value than those with low ER but aged ≤ 41 years. These age-associated differences did not appear in the middle and high ER groups.

The present study is the first to indicate a relationship between ER and HRV in male managers. Specifically, ER has a nonlinear relationship with more adequate HRV figures and moderates the negative effect of age on HRV. Data reveal that both low ER and age over 41 years have a negative effect on HRV in Spanish managers. Moreover, middle and high ER moderate the negative effect of age on HRV. Hence, the ability to regulate emotions seems to be a protective mechanism that facilitates better functioning of the cardiovascular system when the autonomic function begins to deteriorate.⁶ In conclusion, the present study indicates that skill in regulating emotions enables us to respond more adequately to environmental demands and reduces the impact of negative emotions and age on cardiovascular health.^{2,3}

We propose that future research should seek to advance our knowledge of the role of emotional intelligence skills—evaluated with more objective measures—on other health indicators. Given that individuals can be trained in emotional intelligence, these skills may play an important preventative role in the population of healthy people subjected to heavy professional demands.

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