These data show that the percentage of patients with adequate control of the LDL-C levels is insufficient, regardless of the specialty of the attending physician or where they live. This occurs despite the well-known fact that adequate control of cardiovascular risk factors in secondary prevention reduces the rates of morbidity and mortality. An important aspect of CODIMET is its contribution of data on a large population selected on the basis of high cardiovascular risk, consisting of patients with coronary heart disease or type 2 diabetes, considered to be the equivalent to cardiovascular disease. These data confirm the need to transmit and apply the recommendations of the clinical practice guidelines on a wider basis, especially taking into account groups of patients at high risk for experiencing cardiovascular events. The web page provides supplementary material offering additional data from the study.

These findings demonstrate that, in Spain, patients with very high cardiovascular risk, specifically patients with diabetes mellitus and/or coronary heart disease, very often do not achieve the recommended LDL-C levels, regardless of the specialty of the attending physician and the autonomous community in which they live.

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CONFLICTS OF INTEREST

Gustavo Vitale and Belén González Timón are employees of Merck Sharp & Dohme, MSD España.

SUPPLEMENTARY MATERIAL

Supplementary material associated with this article can be found in the online version available at http://dx.doi.org/10.1016/j.rec.2013.04.011.

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Percentiles of Carotid Intima-media Thickness in a Spanish Population With and Without Cardiovascular Risk Factors

Percentiles de grosor íntima-media carotídeo en población española con y sin factores de riesgo cardiovascular

To the Editor,

The measurement of carotid intima-media thickness (CIMT) has been used in cardiovascular epidemiology research over the past two decades in observational and interventional studies. A direct association has been found between carotid artery intima-media thickening and cardiovascular events. Although it seems unlikely that this measure provides a better estimation of cardiovascular risk in the total population, it does provide additional information on patients at intermediate cardiovascular risk.[1]

In Spain, there has been recent and increasing use of CIMT by different clinical and cardiovascular research groups.[2–5] This motivated our decision to describe the population reference ranges of CIMT in 1708 women and 1453 men aged 35 to 84 years. The article, published in December 2012 in the *Revista Española de Cardiología*, included a graphical representation of the 5th, 10th, 25th, 50th, 75th, 90th, and 95th percentiles of mean CIMT in the common carotid artery and all carotid artery segments, stratified by age and sex.[6] We also calculated the 50th percentile of the mean values of both measures of CIMT in a subsample of 468 women and 306 men not exposed to cardiovascular risk factors (without hypertension, diabetes mellitus, and hypercholesterolemia, non-smokers, with high-density lipoprotein cholesterol levels >40 mg/dL, and BMI <30 kg/m^2) stratified by age and sex.

In order to provide as much information as possible to facilitate the use of these data in clinical practice and clinical and epidemiological research, we present the percentiles of the general population on which these graphs were based. We also present the percentiles of the subsample without cardiovascular risk factors.

Carotid ultrasound examinations were performed with an Acuson XP 128 ultrasound machine equipped with an L75-10 MHz transducer and extended-frequency software (Acuson-Siemens; Mountainview, California, United States). Image files were

Table 1

Percentiles (5th, 10th, 25th, 50th, 75th, 90th, 95th) of Mean Common Carotid Artery Intima-media Thickness in the General Population and in Individuals Not Exposed to Cardiovascular Risk Factors, Stratified by Age and Sex

	General population (n=1708)										Population without cardiovascular risk factors* (n=468)									
	35	40	45	50	55	60	65	70	75	80	35	40	45	50	55	60	65	70	75	80
Women																				
5%	0.439	0.460	0.482	0.505	0.525	0.541	0.557	0.573	0.597	0.629	0.441	0.464	0.486	0.509	0.533	0.561	0.597	0.639	0.690	0.750
10%	0.446	0.473	0.499	0.526	0.550	0.571	0.593	0.614	0.637	0.665	0.450	0.479	0.504	0.526	0.548	0.575	0.609	0.647	0.698	0.761
25%	0.471	0.502	0.532	0.560	0.586	0.611	0.638	0.669	0.699	0.727	0.475	0.505	0.532	0.559	0.586	0.615	0.646	0.675	0.727	0.799
50%	0.502	0.543	0.581	0.617	0.650	0.681	0.717	0.751	0.785	0.818	0.500	0.534	0.569	0.606	0.641	0.670	0.698	0.720	0.783	0.884
75%	0.541	0.589	0.634	0.677	0.717	0.756	0.803	0.845	0.893	0.947	0.517	0.564	0.614	0.668	0.720	0.755	0.772	0.774	0.837	0.959
90%	0.569	0.629	0.685	0.738	0.790	0.844	0.905	0.947	0.993	1.045	0.537	0.598	0.658	0.715	0.772	0.813	0.830	0.818	0.865	0.967
95%	0.584	0.651	0.713	0.772	0.830	0.892	0.965	1.022	1.068	1.106	0.543	0.614	0.681	0.743	0.802	0.844	0.858	0.839	0.877	0.970

	General population (n=1453)										Population without cardiovascular risk factors* (n=306)									
	35	40	45	50	55	60	65	70	75	80	35	40	45	50	55	60	65	70	75	80
Men																				
5%	0.474	0.484	0.497	0.513	0.529	0.545	0.570	0.601	0.636	0.675	0.477	0.486	0.501	0.522	0.550	0.585	0.617	0.645	0.704	0.788
10%	0.501	0.508	0.519	0.534	0.552	0.574	0.608	0.638	0.667	0.696	0.483	0.501	0.519	0.539	0.563	0.595	0.629	0.656	0.715	0.796
25%	0.538	0.547	0.561	0.581	0.606	0.635	0.666	0.699	0.737	0.777	0.514	0.535	0.555	0.574	0.596	0.627	0.657	0.685	0.741	0.819
50%	0.590	0.609	0.630	0.654	0.681	0.712	0.750	0.787	0.828	0.874	0.563	0.581	0.600	0.623	0.652	0.686	0.706	0.731	0.781	0.852
75%	0.629	0.658	0.690	0.725	0.764	0.806	0.852	0.891	0.938	0.992	0.596	0.637	0.669	0.695	0.717	0.738	0.756	0.778	0.820	0.879
90%	0.652	0.722	0.778	0.821	0.852	0.885	0.937	0.976	1.038	1.125	0.607	0.681	0.733	0.764	0.779	0.788	0.804	0.820	0.853	0.898
95%	0.667	0.752	0.823	0.878	0.917	0.950	0.996	1.042	1.115	1.219	0.615	0.700	0.757	0.788	0.800	0.807	0.825	0.838	0.866	0.904

* Individuals without hypertension, diabetes mellitus, and hypercholesterolemia, non-smokers, high-density lipoprotein cholesterol levels >40 mg/dL, and BMI <30 kg/m^2.

Table 2

Percentiles (5th, 10th, 25th, 50th, 75th, 90th, 95th) of Mean All-carotid Intima-media Thickness in the General Population and in Individuals Not Exposed to Cardiovascular Risk Factors Stratified by Age and Sex

	General population (n=1708)										Population without cardiovascular risk factors* (n=468)									
	35	40	45	50	55	60	65	70	75	80	35	40	45	50	55	60	65	70	75	80
Women																				
5%	0.449	0.474	0.497	0.520	0.539	0.557	0.576	0.592	0.607	0.621	0.469	0.483	0.500	0.522	0.547	0.577	0.609	0.634	0.676	0.731
10%	0.455	0.484	0.511	0.535	0.557	0.578	0.600	0.619	0.634	0.643	0.472	0.494	0.515	0.537	0.560	0.588	0.618	0.643	0.684	0.740
25%	0.477	0.512	0.544	0.572	0.596	0.619	0.645	0.671	0.690	0.704	0.482	0.514	0.541	0.564	0.588	0.617	0.648	0.670	0.711	0.771
50%	0.501	0.544	0.583	0.618	0.648	0.676	0.706	0.735	0.765	0.797	0.501	0.538	0.574	0.609	0.644	0.675	0.697	0.709	0.762	0.856
75%	0.532	0.583	0.632	0.678	0.720	0.757	0.784	0.811	0.855	0.915	0.543	0.574	0.613	0.660	0.717	0.762	0.775	0.760	0.819	0.950
90%	0.562	0.624	0.683	0.739	0.792	0.841	0.877	0.916	0.972	1.046	0.551	0.598	0.652	0.712	0.784	0.836	0.842	0.805	0.849	0.969
95%	0.569	0.641	0.712	0.779	0.844	0.901	0.940	0.987	1.041	1.099	0.556	0.615	0.680	0.750	0.831	0.883	0.874	0.820	0.856	0.974

	General population (n=1453)										Population without cardiovascular risk factors* (n=306)									
	35	40	45	50	55	60	65	70	75	80	35	40	45	50	55	60	65	70	75	80
Men																				
5%	0.473	0.498	0.521	0.542	0.560	0.576	0.600	0.621	0.652	0.694	0.465	0.500	0.533	0.563	0.591	0.613	0.624	0.641	0.714	0.835
10%	0.491	0.514	0.536	0.560	0.582	0.603	0.629	0.651	0.681	0.719	0.476	0.512	0.545	0.575	0.603	0.626	0.636	0.651	0.721	0.839
25%	0.540	0.560	0.581	0.605	0.630	0.654	0.687	0.719	0.754	0.791	0.516	0.543	0.570	0.597	0.625	0.653	0.665	0.680	0.744	0.851
50%	0.586	0.607	0.632	0.659	0.691	0.725	0.760	0.796	0.828	0.853	0.579	0.602	0.625	0.649	0.675	0.701	0.708	0.723	0.783	0.881
75%	0.625	0.663	0.698	0.733	0.768	0.805	0.837	0.872	0.903	0.928	0.627	0.652	0.677	0.704	0.732	0.757	0.760	0.773	0.828	0.919
90%	0.663	0.724	0.775	0.817	0.852	0.887	0.932	0.978	1.024	1.070	0.641	0.689	0.727	0.757	0.780	0.796	0.793	0.805	0.857	0.943
95%	0.689	0.752	0.808	0.855	0.898	0.940	0.981	1.031	1.085	1.143	0.643	0.708	0.755	0.786	0.806	0.815	0.806	0.817	0.867	0.952

* Individuals without hypertension, diabetes mellitus, and hypercholesterolemia, non-smokers, high-density lipoprotein cholesterol levels >40 mg/dL, and BMI <30 kg/m^2.

recorded and sent to the Academic Vascular Image Centre in Amsterdam for analysis.

The 5th, 10th, 25th, 50th, 75th, 90th, and 95th percentiles were estimated by age and sex, then adjusted using locally weighted scatterplot smoothing for the mean CIMT value of the common carotid artery (Table 1) and all carotid artery segments (common carotid artery, internal carotid artery, and carotid bulb) (Table 2) for the general population and the subsample without cardiovascular risk factors. Statistical analysis was performed using the R Statistical Package version 2.15.0 (R Foundation for Statistical Computing, Vienna, Austria).

In general, CIMT values found in the common segment and common carotid artery in individuals not exposed to cardiovascular risk factors were lower than in the general population. These differences were more accentuated the higher the percentile. Moreover, in some cases the CIMT values of the participants older than 80 years with no risk factors were higher than those in the general population. It is possible that the small number of older participants without risk factors decreased the reliability of the estimations. Furthermore, these findings could be subject to survival bias; despite the advanced age of this population and the fact that they had greater CIMT than the age-matched general population, they had not experienced coronary events.

The results of this analysis provide the reference ranges of CIMT in the general population and in the subsample without cardiovascular risk factors. Further cohort studies are needed to ascertain the additional predictive value of CIMT for the incidence of cardiovascular events.

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Intravascular Diagnosis of Stent Fractures: Beyond X-ray Imaging

Diagnóstico intravascular de fracturas de stents: más allá de la imagen radiológica

To the Editor,

Drug-eluting stents (DES) have significantly reduced the rate of stent restenosis (SR) and the need for repeat interventional procedures. The presence of stent fractures (SF) with the appearance of SR and/or DES thrombosis, particularly with sirolimus-eluting DES (Cypher®), has recently been reported.[1,2] However, the actual incidence of SF is uncertain, and SFs can be hard to diagnose by angiography alone.

We describe the incidence of SF confirmed by intravascular imaging in a patient population angiographically assessed due to suspected SR. A total of 355 SR-type lesions were treated at our site between January 2007 and June 2012: 197 (55%) were conventional stents and 158 (45%) were DES. Intravascular ultrasound or optical coherence tomography was used in 169 (48%) lesions. The incidence of SF confirmed by intravascular imaging was 3.6% (6 of 169 lesions). The characteristics of the SFs are shown in the Table.

SF was radiologically visible in only 1 of the 6 cases identified. In all others, it was suspected due to the presence of focal SR in a tortuous area or a hinge point. On occasion, the SR was not angiographically significant, but the intravascular ultrasound showed considerable focal hyperplasia and the absence of struts in an arch $>270^{\circ}$ (Figs. A and B). The intravascular image was analyzed frame by frame to identify suspected areas and to delimit the presence or absence of struts (Figs. C and D). All 6 patients underwent repeat percutaneous coronary intervention with stent implantation in the SR area. Further clinical follow-up and noninvasive tests showed no new events (median, 9 [3] months).

SF may be diagnosed by radiography (contrast-free imaging) or intravascular imaging, such as intravascular ultrasound or optical coherence tomography. Classifications have been described for both methods, based on the clear separation of struts or the absence of struts in one or more coronary segments.[3,4] Factors that favor the appearance of SF have also been reported, such as the presence of calcium, tortuous arteries, and the degree of artery torsion during the cardiac cycle.