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Short communication

Atorvastatin affects the tissue concentration of hydrogen sulfide in mouse kidneys and other organs*

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Abstract:
Hydrogen sulfide (H_2S) is a crucial co-modulator of cardiovascular, nervous, digestive and excretory systems function. The pleiotropic action of atorvastatin exceeds simple 3-hydroxy-3-methylglutaryl-coenzyme A (HMG-CoA) reductase inhibition and involves multiple biological mechanisms. This study assesses the influence of atorvastatin on the H_2S tissue concentration in mouse brain, liver, heart and kidney. Twenty-four female CBA strain mice received an intraperitoneal injection. The mice were given one of the following solutions: 0.1 mg atorvastatin (5 mg/kg of body weight (b.w.)/day – group D1, n = 8), 0.4 mg atorvastatin (20 mg/kg b.w./day – group D2, n = 8) or a saline physiological control (0.2 ml – group C, n = 8). A modified Siegel spectrophotometric method was used for the H_2S tissue concentration measurements. There was a remarkable rise in the H_2S concentration [μg/g] in the kidney (C: 5.26 ± 0.09, D1: 5.77 ± 0.11, p = 0.0003; D2: 7.48 ± 0.09, p < 0.0001). There were also slight H_2S tissue level changes in the brain (C: 1.61 ± 0.01, D1: 1.75 ± 0.03, p = 0.0001; D2: 1.78 ± 0.03, p < 0.0001), the heart (C: 4.54 ± 0.08, D1: 4.86 ± 0.10, p = 0.0027; D2: 4.56 ± 0.07, p = 0.6997) and the liver (C: 3.45 ± 0.03, D1: 3.27 ± 0.02, p = 0.0001; D2: 3.31 ± 0.02, p = 0.0003). Our study supports the influence of atorvastatin on H_2S tissue concentration in kidneys and other mouse organs.

Key words:
hydrogen sulfide, statins, HMG-CoA reductase inhibitors, kidney, mouse

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