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We prove that all the zeros of a certain family of meromorphic functions are on the critical line $\operatorname{Re}(s) = 1/2$ and are simple (except for possibly $s = 1/2$), by relating the zeros to the discrete spectrum of unbounded self-adjoint operators. For example, for $h(s)$ a meromorphic function with no zeros in $\operatorname{Re}(s) > 1/2$ with $h(s)$ real-valued on \mathbb{R} , and $\frac{h(1-s)}{h(s)} \ll |s|^{1-\epsilon}$ in $\operatorname{Re}(s) > 1/2$, the only zeros of $h(s) \pm h(1-s)$ are on the critical line. One such instance of this result is $h(s) = \xi_k(2s)$ the completed zeta-function of a number field k or, more generally, many self-dual automorphic L -functions. We use spectral theory suggested by results of Lax-Phillips and ColinDeVerdière. This simplifies ideas of W. Müller, J. Lagarias, M. Suzuki, H. Ki, O. Velásquez Castañón, D. Hejhal, L. de Branges and P.R. Taylor. (Received September 19, 2017)