Massive star explosions: clues for Cosmic Ray particles and maximally rotating black holes?

What is the physical process that gives the same knee and ankle energy for all Super-Nova (SN) explosions that contribute strongly to particles in that energy range? Why do the observed stellar mass black holes (BHs) show negligible spin before merging? There are two typical energies in the spectrum of cosmic rays, the knee energy $E_{CR,\text{knee}}$, where the spectrum turns down, and the ankle energy $E_{CR,\text{ankle}}$, where the spectrum of Galactic CR particles is believed to turn off altogether. Both energies are proportional to $e Br$, observed in wind-SNe and match. That energy squared is proportional to the angular momentum transport in an observed Parker type wind of a wind-SN. So our proposal to interpret these observations is: A freshly formed stellar mass BH of maximal rotation rapidly loses its spin (A. Chieffi). The observations suggest $(e Br)^2 = m_p^* m_{Pl} c^4$ with $m_p^*$ close to $m_p$, with an error of $10^{0.05\pm0.08}$ (M. Allen). This expression can be interpreted as a maximal Penrose process using $p \bar{p}$ or $e^+ e^-$ pairs. Spin-down gives a luminosity scale:

$$L_{\text{rot}} = \frac{\hbar c}{e^2} \frac{m_p c^2}{\tau_{Pl}}$$

This is analogous to the luminosity scale for BH mergers, called the Planck luminosity: $L_{GW} = (m_{Pl} c^2)/(\tau_{Pl})$. In this latter expression the quantity $\hbar$ scales out, as it is equal to $c^5/G_N$. In the spin-down expression $\hbar$ does not scale out, and so is the signature of a combination of General Relativity with Quantum Mechanics based on observations. Both times, the characteristic time scales with the BH mass, while the luminosity scale is independent of BH mass. The EHT observations of the super-massive black hole in the galaxy M87 are consistent with the values for the product $Br$ as well as the observed luminosity. In the quantum mechanical model of BHs (R. Casadio) the spin-down would correspond to the transition to lower values of the angular momentum number by the emission of energy as well as absorption of $p \bar{p}$, or $e^+ e^-$ (with a suitable power of $2\pi$).