As it was discovered earlier the crystal lattice of ternary hexagonal RTX compounds exhibits a criticality for specific values of the ratio of the lattice parameters c/a around the interval of 0.565 – 0.575. To explore this effect in more detail, we have prepared polycrystalline samples of Ce1-xYxPdAl and SmPdAl and monocrystalline SmPdAl, SmNiAl. In case of Ce1-xYxPdAl series the forbidden range of c/a values was found to evolve with composition and temperature. Structural transformation is temperature independent in these compounds. SmPdAl compound is single-phased in the whole temperature range even though the c/a ratio crosses the gap of forbidden values common for other compounds. However a criticality in evolution of c/a is present at temperature 500 K. Anomaly visible on magnetic and transport properties, which is connected with change of structure, was found at approximately the same temperature. Explanation based on enhanced thermal movement of the atoms is proposed. Besides, also magnetic measurements at low temperatures were performed. The magnetic ordering temperature Tc = 15.3 K and dominant antiferromagnetic order was found. Monocrystalline SmNiAl exhibits very similar behaviour to the SmPdAl.