was significantly reduced in the R + L and R + H groups, but was least severe in the high-dose group.

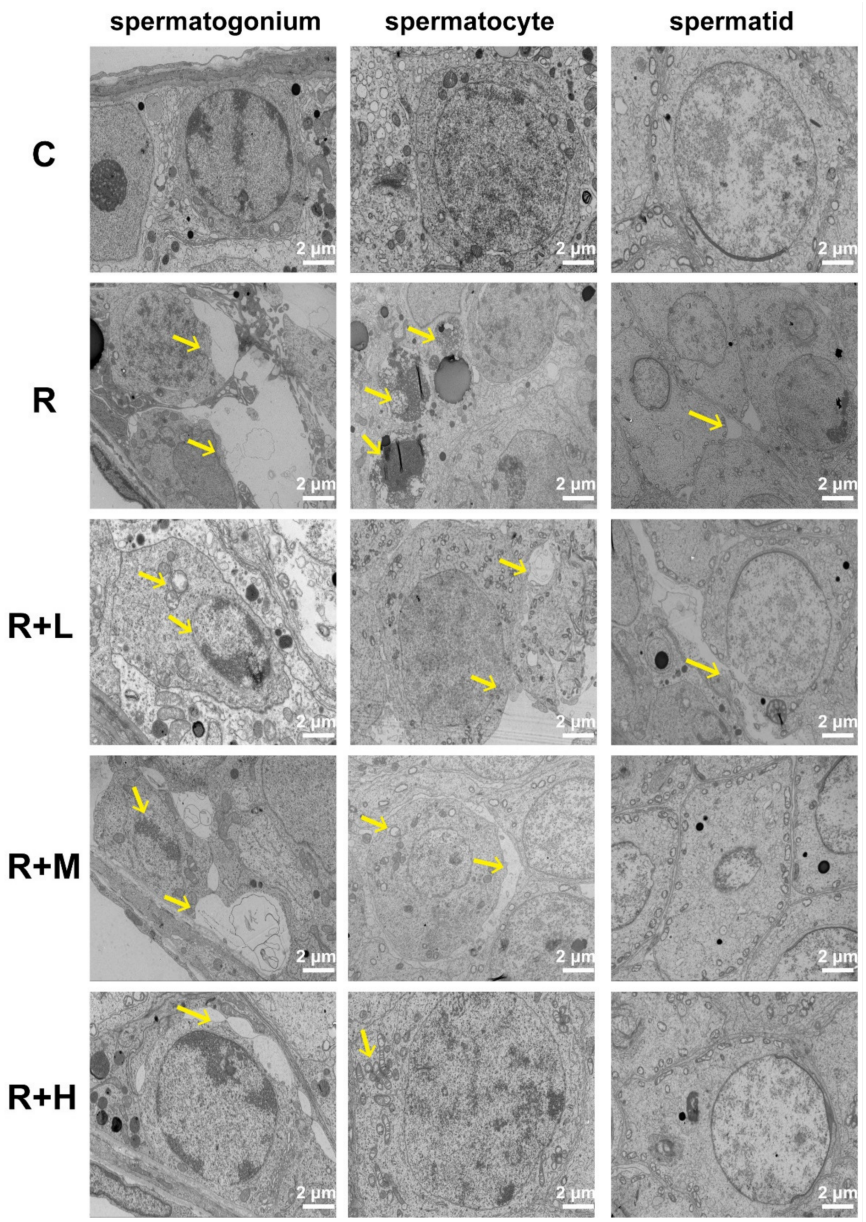


Figure 3. Metformin relieved ultrastructural abnormalities in testicular tissue caused by microwave radiation (TEM, scale bar = 2 μm, n = 3 for each group). Ultrastructural changes of each group at 6 h after microwave radiation are shown. Normal spermatogonia, spermatocytes, and spermatids in testicular tissue were observed in the C group. In the R group, swelling and cavitation, chromatin condensation, mitochondrial swelling, and hollowing were observed. The abnormalities were reduced in the R + L, R + M, and R + H groups; the R + H group had the fewest abnormalities. Arrows indicate the sites of the injuries.

2.3. Metformin Ameliorated the Microwave-Radiation-Induced Alteration of Hormones

Testosterone and Inhibin B have been frequently used as hormone biomarkers indicating reproductive functions. Our results showed that the testosterone level in the radiation group was significantly higher than in the control group at 6 h, 7 d, 14 d, and 28 d after radiation ($p < 0.01$), and metformin reversed the changes in radiated rats ($p < 0.05$ or $p < 0.01$) (Figure 4A). A significant decrease in Inhibin B was observed in the microwave radiation group at 6 h, 7 d, 14 d, and 28 d ($p < 0.01$); furthermore, in the microwave