Human exposure and elimination to pollutants play a key role in determining their health effects. In this study exposure and elimination to PAHs, an important and ubiquitous environmental pollutants, were explored based on biomarker analysis. Briefly, human biological samples were collected from a non-occupational exposed population in rural region of Northern China, and PAHs in serum and their hydroxylated metabolites (hydroxyPAHs) in both urine and serum were measured by GC-MS. Geometric mean concentrations of urinary hydroxyPAHs were 0.57, 2.16, 4.99, and 7.05 μg/g creatinine for 1-hydroxypyrene, hydroxyphenanthrenes, hydroxyfluorenes, and hydroxybiphenyls, respectively, which were nearly one order of magnitude higher than those from non-occupational US population. Sampling season was the predominant factor on urinary hydroxyPAHs, and in urine samples collected in the heating-season of winter, levels of 1-hydroxypyrene, hydroxyphenanthrenes, hydroxyfluorenes, and hydroxybiphenyls were 6.04, 3.94, 2.37, and 2.29-fold of those in non-heating season of spring, respectively, indicating a higher PAHs exposure in heating season probably due to household heating. On the contrary, precursor pollutants (i.e., PAHs) in serum in heating season were 0.31, 0.085, 0.13, and 0.16 of those in non-heating season for pyrene, phenanthrene, fluorene, and biphenyl, respectively, suggesting an elevated clearance to serum PAHs in heating season. Estimated half-lives of PAHs in serum in heating season ranged from 2.2% to 6.4% of those in non-heating season. Although further researches are warranted, this study proposed a possible association between human exposure and elimination to PAHs. To reveal the underlying mechanism under this kind of gene-environment interaction could be a key to evaluate the health effects of exposure to these pollutants.