It has been found in previous studies that hypertensive patients of different constitutions, some of prosperous impetuous (PI) constitution, and some of sluggish meticulous (SM) constitution, show significant difference in insulin sensitivity and insulin resistance. In order to explore the relationship between patients' constitution and IR, a study on oral glucose tolerance test (OGTT) and insulin release test (InRT) were conducted in 217 essential hypertensive patients of either sluggish meticulous (SM) constitution (139 cases) or prosperous impetuous (PI) constitution (78 cases), and the polymorphism of three genes, including insulin-like growth factor-1 receptor (IGF-1R), insulin receptor substrate-1 (IRS-1) and 2 (IRS-2) genes were detected. Results: (1) OGTT, InRT and insulin resistance index (Homa-IR) were higher and insulin sensitive index (ISI) was lower in the patients of SM constitution than those in patients of PI constitution. (2) Significant difference of ISI and Homa-IR was shown in patients of both constitutions with genotype G of the 3 genes. Conclusion: Decrease of insulin sensitivity and increase of insulin resistance are more obvious in hypertensive patients with genotype G of the 3 genes of SM constitution than in those of PI constitution. Therefore, the difference in constitution might be one of the genetic characteristics for insulin resistance in hypertensive patients.

KEY WORDS essential hypertension, insulin resistance, constitution classification, polymorphism of gene, prosperous impetuous constitution, sluggish meticulous constitution
sensation in mouth, difficulty in movement as if
the body were tightly enwrapped by something,
loose stool, dry mouth but with no desire for
drinks, chest fullness, dizziness, soft or slippery
pulse, and greasy tongue coating.

Criteria for inclusion and exclusion: Patients
with essential hypertension, aged 18-80 years,
of both sexes, and capable to sign the informed
consent were included. Those of secondary
hypertension and diabetes mellitus were
excluded from enrollment by means of history
inquiry, physical examination, and laboratory
tests.

General Materials
The two-hundred and seventeen patients
with hypertension enrolled were classified into
two groups according to their constitution by
TCM. Patients of PI constitution were 38 males
and 40 females; aged 37-80 years, 59.87 ± 7.52
years on average; with the illness course of 1-37
years, 11.09 ± 8.58 years on average. Patients
of SM constitution were 88 males and 51
females; aged 31-79 years, 56.71 ± 7.57 years
on average; with the illness course of 1-49 years,
13.34 ± 9.84 years on average.

The two groups were significantly
different in age and sex (P=0.030 and P=0.037
respectively), but insignificantly different in
illness course, blood pressure (134.23 ±
1.66/84.30 ± 1.12 mm Hg vs 134.34 ± 1.24/
82.45 ± 0.83 mm Hg) and body weight index
(BMI, 25.45 ± 0.39 vs 25.49 ± 0.29).

Items and Methods of Examination
Before observation, the administration of
hypotensive agents that could affect glucose
metabolism such as β-receptor blocker and
thiazine diuretics had to be withdrawn from all
the patients for 2 weeks. After that, the following
parameters and tests were measured and
performed.

Blood Pressure, Body Weight and Height
Blood pressure (BP) in sitting posture was
measured by a specifically appointed staff. The
measurement was done three times every time
and the mean value of the results was taken as
the value of BP at that time. Body weight (BW)
and body height (BH) of patients were also
measured. Then the BMI was calculated by BW/
BH (kg/m²).

Oral Glucose Tolerance Test and Insulin Release
Test
The two biochemical tests were performed
in the following way: After a 12-h fasting, venous
blood sample of the patients was collected at 8:00
AM (T0), then, 75 g of glucose was orally given
and venous blood samples collected again after
30 min (T1), 60 min (T2), 120 min (T3), and 180
min (T4). All the blood samples were obtained to
determine the level of plasma glucose (PG) by
glucose-oxidase method and that of insulin (INS)
by double antibody radioimmunoassay, and their
natural logarithm was taken for analysis.

Calculation of Insulin Sensitive Index and Insulin
Resistance Index
Insulin sensitive index (ISI) and insulin
cistance index (Homa-IR) were used for
evaluating insulin resistance and they were
calculated with the following formula adopted:

\[
\text{ISI} = 1 \times \frac{\text{Fasting PG}}{\text{Fasting INS}}
\]

\[
\text{Homa-IR} = \frac{\text{Fasting PG} \times \text{Fasting INS}}{22.5}
\]

Determination of Polymorphism of Insulin
Receptor-related Genes
Three important genes in insulin signal
transmission path were selected, i.e., the genes
of insulin-like growth factor-1 receptor (IGF-
1R), insulin receptor substrate-1 (IRS-1) and 2
(IRS-2), and the polymorphism of their single
nucleotide were determined. ADD1Gly460Trp
typing was applied on DNA abstracted for 4 mL
of peripheral venous blood with MALDI-TOF mass
spectrometry with the PCR primer designed with
Mass ARRAYTM Assay Design 2.0 Software,
through multiple PCR augmentation, SAP
purification, extension and resin purification, and
the purified product was spotted on the Spectro-
Chip for detection by MassARRAYTM Analyzer.
The phenotypes of genes were analyzed with the
software MassARRAYTM Typer 3.0.1, with the
automatic output as GG, GT or TT.

Statistical Analysis
With SPSS 12.0 Software, the inter-group