middle cerebral artery: reference values at rest and during hyper-
ventilation in healthy volunteers in relation to age and sex.
Doppler ultrasound for the assessment of intracranial arterial flow

Background Factors and Clinical Symptoms of
Major Depression With Silent Cerebral Infarction
To the Editor:
In their recent article, “Background factors and clinical symp-
toms of major depression with silent cerebral infarction,” Fujikawa
et al1 used magnetic resonance imaging to determine whether depressed patients had or did not have silent
cerebral infarction and then compared the two groups in terms of
a variety of risk factors for stroke and depression. It is surprising
that the authors do not relate their findings to a large body of
literature reporting similar results but using different terminol-
yogy. Leukoencephalopathy, deep-white-matter hyper-
intensity, or subcortical hyperintensity. These terms are essentially
used to describe hyperintensities on T2-weighted spin-echo mag-
netic resonance images of the brain.
Small hyperintensities are related to perivascular spaces; larger
hyperintensities (maximum linear dimension, >5 mm) are usually
seen on pathological examination to consist of areas of myelin pallor,
infarcts, or lacunes. These large signal hyperintensities are the basis
of patient classification by Fujikawa et al.1 A brief review of the
literature that links these hyperintensities to depression may be of
interest to your readers. Since the publication of our initial report
indicating that these hyperintensities are common in elderly de-
pressed patients,2 numerous researchers have noted the high fre-
quency and severity of these hyperintensities in elderly depressed
patients compared with control subjects.2,3 Coffey et al4 reported
that lesions of the basal ganglia were frequent in depressed patients
depressed patients compared with control subjects. Zubesko et al5 noted a higher
incidence of cortical infarctions and leukoencephalopathy in depressed
patients, and Figiel et al reported that the frequencies of large deep white-matter hyperintensities and lesions of the basal
ganglia were greater in late-onset depressed patients than in those
with early-onset depressed patients of similar age. Basal-ganglia hyperinten-
sities have also been linked to an increased likelihood of delirium
induced by antidepressants or electroconvulsive treatment.6,7
This fairly extensive literature and the report by Fujikawa et al1 suggest that cerebrovascular damage may indeed be important in
the pathophysiology of major depression in the elderly and worthy
of further study.

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References
1. Fujikawa T, Yamawaki S, Touhouda Y. Background factors and
clinical symptoms of major depression with silent cerebral
2. Post F. The management and nature of depressive illness in late life:
1983;142:111-119
4. Figiel GS, Krishnan KRR, Breitner JC, Nemeroff CB. Radiologic
correlates of antidepressant-induced delirium: the possible signif-
5. Figiel GS, Coffey CE, Djang WT, Hoffman G Jr, Doraiswamy PM.
Brain magnetic resonance imaging findings in ECT-induced

Response
We thank Drs Krishnan, Turel, and McDonald for their comments on our article.1 In our study, we observed that cere-
brovascular damage plays an important role in the pathophysiol-
yogy of major depression in the elderly and that risk factors for cerebrovascular disease (eg, hypertension) are related to the onset
of senile major depression. It was reported that senile major
depression often persisted despite antidepressant therapy and has
a poor prognosis.2,3 Figiel et al4 reported that basal-ganglia
hyperintensities are linked to an increased likelihood of delirium
with antidepressants.

We suspect that major depression with silent cerebral infarction
(especially mixed artery infarction with broad obstruction) persists
despite administration of antidepressants and is related to refrac-
tory depression in old age. Subsequently, we suspect that major
depression with mixed artery silent cerebral infarction can pro-
gress to vascular dementia. We would like to study further the
response in the elderly to antidepressant therapy and the long-
term prognosis for major depression with silent cerebral infarction.

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References
1. Fujikawa T, Yamawaki S, Touhouda Y. Background factors and
clinical symptoms of major depression with silent cerebral
2. Post F. The management and nature of depressive illness in late life:
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4. Figiel GS, Krishnan KRR, Breitner JC, Nemeroff CB. Radiologic
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'Normal' 99mTc-HmPAO Distribution in Large
Subacute Middle Cerebral Artery Infarct
The term “luxury perfusion” is used to describe situations of
paradoxical cerebral blood flow (CBF) increase1 or flow values
that are high in comparison with metabolic demand.2 The idea
prevailed until 1993 that the 99mTc hexamethylpropyleneamine
oxime (99mTc-HmPAO) hyperfixation observed in the subacute
stage after cerebral infarct was due to luxury perfusion. However,
recent observations have shown that in these circumstances,
hyperfixation with 99mTc-HmPAO does not always correspond with
CBF increase.2 In the following case, single-photon computed
tomography (SPECT) was clearly abnormal with 18F-fluorodeox-
oglucose (FDG) and 99mTc ethylene cation dimer (99mTc-ECD) but paradoxically normal with
99mTc-HmPAO in the subacute stage of middle cerebral artery
(MCA) infarct.
A 34-year-old man came to our hospital on May 21, 1991, with
meningeal hemorrhage consequent to rupture of a left carotid
terum. He underwent surgery 3 days later without

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