Dramatic Changes in the Performance of Endarterectomy for Diseases of the Extracranial Arteries of the Head

Robert Pokras, MA, and Mark L. Dyken, MD

Data from the National Hospital Discharge Survey have been reviewed each year to estimate the number of endarterectomies of extracranial vessels of head and neck performed in nonfederal hospitals in the United States. The number dramatically increased from 15,000 in 1971 to 107,000 in 1985. Regression estimates using data from 1971–1985 indicate that 127,000 procedures were expected for 1986, but the observed estimate indicated a dramatic drop to 83,000. Data reviewed suggest that on balance this reduction may have a favorable effect on stroke mortality and morbidity. (Stroke 1988;19:1289–1290)

The purpose of this article is to report a dramatic change in the trend for the performance of carotid endarterectomy based on updated estimates from the National Hospital Discharge Survey (NHDS) for the United States.

Subjects and Methods

The NHDS, described in detail elsewhere,1 is a survey of short-stay nonfederal hospitals in the 50 states and the District of Columbia. The source document for data used in the survey is the face sheet of the medical record. Medical and surgical information was coded using the International Classification of Diseases (Eighth Revision in 1970–1978, Ninth Revision in 1979–1986). We updated the analyses reported for 1971–1982 for 1983–1986, the most recent data available from the NHDS.

Results

As reported, the estimated number of carotid endarterectomies performed substantially increased from 1971 to 1982, from 15,000 to 82,000.2 The in-hospital mortality rate for endarterectomy patients for these 12 years was approximately 2.8%. The estimated number of procedures continued to increase for 3 years after 1982, to 95,000 in 1983, 103,000 in 1984, and 107,000 in 1985. However, in 1986 a dramatic 22% decline to 83,000 occurred, with a relative standard error of 6%. The combined mortality rate for those 4 years was 2.6%. Figure 1 is a plot of the number of carotid endarterectomies estimated from the NHDS for 1971–1986. A quadratic regression function that describes the points for the 15 years \( Y = (\text{year} - 1970)^2 \times B + A \), where \( Y \) is the predicted number of carotid endarterectomies, \( \text{year} \) is the year of the estimate, and \( A \) and \( B \) are regression coefficients) is drawn. This equation provides an excellent fit to the data, with a correlation coefficient \( R \) of 0.993. The equation predicts 127,000 carotid endarterectomies for 1986, significantly greater than the 83,000 procedures estimated from the NHDS for 1986. The observed estimate of 83,000 procedures in 1986 is significantly less than the 107,000 estimated in 1985 (\( p<0.01 \)).

Discussion

In the November–December 1984 issue of Stroke, we reported the substantial increase in the number of carotid endarterectomies in short-stay hospitals, from 15,000 in 1971 to 82,000 in 1982, and noted that approximately 2.8% of the patients operated on were discharged dead.1 In that same issue of Stroke, three other clinical studies3–7 and an editorial8 gave further attention to the lack of well-defined indications for the procedure and unusually high complication rates in some institutions and communities. These concerns were supported by other studies before and in 1985 and 1986 and have been widely disseminated.9–14 It is quite likely that, because of the temporal relationship, this information may have precipitated requests for second opinions and...
that the decrease in the performance of endarterectomies was in the more controversial cases. Recently the Rand Corporation, on the basis of a modified Delphi technique, published the results of a random sample of 1,302 Medicare patients in three geographic areas who had endarterectomy in 1981. The Rand Corporation concluded that, by their criteria, 32% of the procedures were inappropriate and 32% were equivocal and that the 9.8% complication rate of stroke with residual deficit or death was so high that endarterectomy was not warranted even in appropriate instances "because the risks would almost certainly outweigh the benefits." If these criteria are correct, it is hoped that our observed decrease in the performance of endarterectomy was in the inappropriate category. Unfortunately, no proper study is now available to determine whether the conjectures of a Delphi panel are correct. Regardless, in the opinion of many, these reports are sobering enough to warrant the performance of properly designed large-scale multicenter clinical studies to determine the exact indications for endarterectomy and the maximal complication rate permissible for benefit to exceed risk.

References

KEY WORD • endarterectomy
Dramatic changes in the performance of endarterectomy for diseases of the extracranial arteries of the head.
R Pokras and M L Dyken

*Stroke.* 1988;19:1289-1290
doi: 10.1161/01.STR.19.10.1289

*Stroke* is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 1988 American Heart Association, Inc. All rights reserved.
Print ISSN: 0039-2499. Online ISSN: 1524-4628

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://stroke.ahajournals.org/content/19/10/1289

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in *Stroke* can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial Office. Once the online version of the published article for which permission is being requested is located, click Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the Permissions and Rights Question and Answer document.

Reprints: Information about reprints can be found online at:
http://www.lww.com/reprints

Subscriptions: Information about subscribing to *Stroke* is online at:
http://stroke.ahajournals.org//subscriptions/