18 Shannon KM. Hemiballismus. *Clin Neuropharmacol* 1990; 13: 413–25.
19 DeLong MR, Crutcher MD, Georgopoulos AP. Primate globus pallidus and subthalamic nucleus: functional organization. *J Neurophysiol* 1985; 53: 530–43.
20 Alexander GE, Crutcher MD. Functional architecture of basal ganglia circuits: neural substrates of parallel processing. *Trends Neurosci* 1990; 13: 266–71.
21 DeLong MR. Primate models of movement disorders of basal ganglia origin. *Trends Neurosci* 1990; 13: 281–85.
22 Laitinen LV, Bergenheim AT, Hariz MI. Leksell's posteroventral pallidotomy in the treatment of Parkinson's disease. *J Neurosurg* 1992; 76: 53–61.
23 Hitchcock ER, Clough C, Hughes R, Kenny B. Embryos and Parkinson's disease. *Lancet* 1988; i: 1274.
24 Lindvall O, Widner H, Rehncrona S, et al. Transplantation of fetal dopamine neurons in Parkinson's disease: one year clinical and neurophysiological observations in two patients with putaminal implants. *Ann Neurol* 1992; 31: 155–65.
25 Fahn S. Fetal-tissue transplants in Parkinson's disease. *N Engl J Med* 1992; 327: 1589–90.

Look-back study of infectivity of anti-HCV ELISA-positive blood components

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The infectivity of blood components from donors who were later found to be anti-HCV ELISA-positive was investigated in recipients who were enrolled in a look-back programme. Recipients received ELISA-positive blood components from donors who were PCR-positive and/or RIBA-2-positive (n=22, group A) or PCR-negative and indeterminate or negative on RIBA-2 (n=105, group B). 26 of 32 (81%) recipients of group A donors and none of 140 of group B were HCV-infected. All stored serum samples of previous donations (n=172) of group A donors were anti-HCV-positive in RIBA-3, indicating a chronic carrier state of HCV in these donors.

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The tracking and testing of recipients of blood components from donors who are later found to be infected with HIV is standard procedure in blood banking (look-back).[1] Look-back for recipients of blood components infected with hepatitis C virus (HCV) is controversial.[2] Dutch guidelines for blood banks required that all anti-HCV ELISA-positive blood products be discarded and the donors be deferred, irrespective of results of recombinant immunoblot assay (RIBA). Further, blood banks have to inform doctors when a patient has received blood components from a donor later found to be HCV infected. The blood bank must then be notified about the recipient's test results. In this study we assessed the infectivity of blood components donated before an anti-HCV ELISA-positive donation in two groups of donors with accurate ascertainment of HCV status.

From May, 1990, to January, 1992, 139 138 whole-blood donations were tested for anti-HCV antibodies (ELISA-1/2, Ortho). ELISA-positive (repeatedly reactive) donations were confirmed by RIBA-2 (Ortho) and PCR.[3] 32 (0·02%) donors were confirmed positive. Of these, 10 (31%) were first-time donors and 22 (69%) were repeat donors.

All hospitals were notified of blood components previously released from 22 donors later found to be HCV-infected—ie, PCR-positive and/or RIBA-2-positive (group A). As a research project, one academic hospital was informed about previously released blood components from 105 donors later found to be ELISA-positive, PCR-negative, and negative or indeterminate on RIBA-2 (group B). The general practitioner was asked to notify the recipient, and then a physician of the blood bank visited the patient at home. After informed consent, standardised interviews were done, including risk factors for HCV infection.[4] Blood samples were collected for anti-HCV and PCR testing.[3] All serum samples were tested in 1994 with a third-generation ELISA (ELISA-3, Ortho). ELISA-positive samples were confirmed by third-generation RIBA (RIBA-3, Ortho) and PCR.[3]

Stored serum specimens from previous donations (1986–92) from group A and B donors were tested in 1992 with ELISA-2. In addition the first and last serum sample of each group A donor was tested with RIBA-3 in 1994. Because of the costs, this was omitted in the group B donors. The χ^2 test with Yates' correction was used for comparison.

From 22 group A donors, 270 blood components were delivered to various hospitals (table). Information was received from the hospitals about 127 of 270 (47%) cases: 57 of 127 recipients (45%) had died, 31 (24%) could not be traced, and 39 (31%) were available for testing. Of these 39, 7 (18%) had an independent risk-factor for HCV infection (multi-transfusion) and were excluded. From the remaining 32 patients, 26 (81%) were HCV-infected (ELISA-3/RIBA-3/PCR-positive); 1 was ELISA-3-positive, RIBA-3-indeterminate (C100 only), and PCR-negative; and 5 (16%) were negative in all tests. Information from the other 143 (53%) cases is pending.

Of 26 HCV-infected recipients of blood products from group A donors, 17 (65%) received red-cell concentrates, 2 (8%) platelets, and 7 (27%) fresh frozen plasma. Of the 6 non-HCV-infected recipients, 5 (83%) received red-cell concentrates, and 1 fresh frozen plasma (not significant). Of 17 HCV-infected recipients of red-cell concentrates from group A donors, the age of the products (the time between donation and transfusion) was 8·2 (range 1–17) days and of 5 non-infected recipients 9·2 (1–14) days (not significant).

	Group A	Group B
Recipients not traceable	31	43
Recipients died	57	264
Procedure pending	143	26
Recipients excluded*	7	8
Recipients tested (+ve/total)	26/32 (81%)	0/140
Total blood products	270	481

*Other risk factors for HCV.

Table: **Results of look-back in recipients of blood products**

Of 105 group B donors, 481 blood components were delivered to one academic hospital (table). Information was received about 455 of 481 (95%) cases: 264 (58%) recipients had died, 43 (9%) could not be traced, and 148 (33%) were available for testing. Of these 148, 8 (5%) had an independent risk factor for HCV infection (multi-transfusion) and were excluded. All 140 remaining patients (62 received RIBA-2-indeterminate and 78 RIBA-2-negative components) were ELISA-3-negative. Information from the other 26 (12%) cases is pending.

From 22 group A donors, 172 stored sera from previous donations (mean 8 per donor, range 2–17) over a mean follow-up of 39 months (range 4–64) were tested. All were ELISA-2-positive. The first and last serum sample was also RIBA-3-positive. There was no difference in HCV-antibody recognition patterns between the first and last sample.

In total, 105 group B donors donated 1060 times (mean 10 per donor [range 2–20], mean follow-up 44 months [range 3–70]). Look-back on recipients of these 1060 donations was restricted to one hospital, in which only 481 blood components were followed up.

Testing of previous donations of group B donors revealed that 38 of 105 (36%) were consistently ELISA-2-negative, 49 (47%) were consistently positive, and 18 (17%) were intermittently positive.

We established that blood donations that were ELISA-2-positive, PCR-negative, and negative or indeterminate on RIBA-2 were not infectious, which is in agreement with prospective studies.[5,6] Therefore these donors can be reassured that they are not infected with HCV. Because ELISA-3 and RIBA-3 are more sensitive than ELISA-2 and RIBA-2,[7,8] re-entry of RIBA-2-negative blood donors to the donor pool is now authorised in the Netherlands, provided that future donations are ELISA-3-negative.

All HCV confirmed-positive blood donors were chronic carriers. None seroconverted during a mean of 3·5 years of observation. The frequency of acute HCV infection among blood donors in the Netherlands is probably low.

Because we found that 81% of recipients of PCR-positive blood components were HCV-infected, there is a strong argument for look-back and notification of recipients to prevent the spread of HCV and to provide the option of treatment with anti-viral drugs.

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References

1 Samson S, Busch M, Ward J, et al. Identification of HIV-infected transfusion recipients: the utility of crossreferencing previous donor records with AIDS case reports. *Transfusion* 1990; 30: 214–18.

2 Busch M. Let's look at human immunodeficiency virus lookback before leaping into hepatitis C virus lookback. *Transfusion* 1991; 31: 655–61.

3 Cuypers HTM, Bresters D, Winkel IN, et al. Storage conditions of blood samples and primer selection affect the yield of cDNA polymerase chain reaction products of hepatitis C virus. *J Clin Microbiol* 1992; 30: 3220–24.

4 van der Poel CL, Cuypers HTM, Reesink HW, et al. Risk factors in HCV infected blood donors. *Transfusion* 1991; 31: 777–79.

5 Ebeling F, Naukkarinen R, Leikola J. Recombinant immunoblot assay for hepatitis C virus antibody as predictor of infectivity. *Lancet* 1990; 335: 982–83.

6 van der Poel CL, Cuypers HTM, Reesink HW, et al. Confirmation of hepatitis C virus infection by new four-antigen recombinant immunoblot assay. *Lancet* 1991; 337: 317–19.

7 Uyttendaele S, Claes H, Mertens W, Verhaert H, Vermylen C. Evaluation of third-generation screening and confirmatory assays for HCV antibodies. *Vox Sang* 1994; 66: 122–29.

8 Zaaijer HL, Vrielink H, van Exel-Oehlers PJ, Cuypers HTM, Lelie PN. Confirmation of hepatitis C infection: a comparison of five immunoblot assays. *Transfusion* 1994; 34: 603–07.

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Failure of amniotic-fluid-cell growth: is it related to fetal aneuploidy?

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We investigated outcome in patients whose amniotic-fluid-cell samples showed unexplained growth failure in culture. 32 of 7872 amniocentesis samples were classified as unexplained growth failures. 10 women did not have repeat cytogenetic testing, but among their pregnancies there were 4 abnormal outcomes (1 fetal bladder-outlet obstruction, 2 stillbirths, and 1 acardiac twin). Of the 22 patients who had repeat karyotypic analysis, 18 had normal fetal karyotypes. However, 4 fetuses were aneuploid (2 trisomy 21, 1 trisomy 13, and 1 Pallister-Killian syndrome).

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Analysis of amniotic-fluid cells by amniocentesis continues to be a standard for prenatal genetic testing. Techniques used for amniocentesis and subsequent cytogenetic analysis have been refined, but there remains a small percentage of cultures that do not yield reportable karyotypes. Repeat cytogenetic analysis from initially unsuccessful chorionic-villus sampling procedures yielded a higher rate of aneuploidy than initially successful procedures.[1]

No study has investigated the general belief that cytogenetic failures from the culture of amniotic-fluid cells occur sporadically and are of no clinical significance. We have investigated the outcome of pregnancies complicated by cell growth failure.

We retrospectively analysed cytogenetic results from 7872 consecutive amniotic-fluid samples submitted to two cytogenetics laboratories between 1987 and 1994 (Medical College of Ohio, 1987–90, and University of Colorado Health Sciences Center, 1991–94). All amniotic-fluid samples were obtained by transabdominal amniocentesis between 12 weeks of gestation and