JOSEPH, A. B. (1986) Focal central nervous system abnormalities in patients with misidentification syndromes. *Bibliotheca Psychiatrica*, **164**, 68–79.
MORRISON, R. L. & TARTER, R. E. (1984) Neuropsychological findings relating to Capgras syndrome. *Biological Psychiatry*, **19**, 1119–1128.
RUBIN, E. H., DREVETS, W. C. & BURKE, W. J. (1988) The nature of psychotic symptoms in senile dementia of the Alzheimer type. *Journal of Geriatric Psychiatry and Neurology*, **1**, 16–20.
SIGNER, S. F. (1987) Capgras' syndrome: the delusion of substitution. *Journal of Clinical Psychiatry*, **48**, 147–150.
SUNDERLAND, T., ALTERMAN, I. S., YOUNT, D., *et al* (1988) A new scale for the assessment of depressed mood in demented patients. *American Journal of Psychiatry*, **145**, 955–959.
WECHSLER, D. (1945) Standardized memory scale for clinical use. *Journal of Psychology*, **19**, 87–95.

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Delusional Misidentification, AIDS and the Right Hemisphere

PAUL CRICHTON and SHÔN LEWIS

A patient with AIDS developed the Capgras' syndrome as part of an acute confusional state resulting from an opportunistic infection. Neuropsychological testing suggested non-dominant hemisphere dysfunction with impaired facial recognition. Serial CT scanning showed a right parietal lesion which resolved after the psychosis improved. These findings provide further evidence for the hypothesis that selective visuospatial deficits underlie the development of Capgras' syndrome.

Capgras' syndrome (Capgras & Reboul-Lachaux, 1923) is characterised by the delusion that persons familiar to the patient have been replaced by physically identical imposters. The rarity of the syndrome, coupled with its striking phenomenology, has given rise to a variety of explanations. Psychoanalytic formulations, first mooted by Capgras & Carette (1924), are still favoured by many (Berson, 1983). Recently, however, several authors have noted that indicators of organic brain disease are often found in Capgras' syndrome patients. Electrophysiological and neuroimaging studies have shown focal or diffuse abnormalities to exist in the majority of cases investigated (Christodoulou, 1977; Lewis, 1989). The broad hypothesis arising from such reports is that the form and, to some extent, the content of the syndrome is mediated not so much by psychodynamic mechanisms as by the presence of a subtle neuropsychological impairment of visual perception and memory.

This report describes a case in which the Capgras' syndrome in a patient with clinical AIDS was associated with a right-sided neuroradiological abnormality and corresponding neuropsychological deficits.

Case report

The subject, a 30-year-old homosexual man who worked as a computer consultant, had had no previous psychiatric history and no history of drug or alcohol abuse. His elder sister had had two psychiatric admissions at the age of 37 years, when, according to the patient, she "started to take religion too seriously"; no details of her diagnosis and treatment were available.

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The patient's birth followed a pregnancy during which his mother contracted rubella in the first trimester. There were no sequelae apart from some impairment of hearing in his right ear. At the age of 25 years he was ill for a month with hepatitis (type unknown) and at 26 he was treated for anal gonorrhoea. The patient remained well until aged 30 years when he developed flu-like symptoms with night sweats and a sore throat, was found to have candidiasis of the mouth and throat and treated with ketoconazole. HIV serology at that time was found to be positive. During the next three months, the candidiasis and flu-like symptoms returned and he developed respiratory symptoms for the first time with shortness of breath and coughing. He was treated with azidothymidine (AZT), but worsening symptoms led to his admission to hospital.

On admission, a clinical and radiological diagnosis of AIDS with pneumocystis pneumonia was made and the patient was treated with high doses of co-trimoxazole. He was noted to be anxious and withdrawn during the first three days of admission.

The following day his oxygen partial pressure ($P\text{-}O_2$) had fallen to 43 mmHg (normal range 88–115), his temperature had risen to 39.3 °C and his mental state was described as "awake, but confused": he said that everybody he knew had caught AIDS from him and would die. Cerebrospinal fluid (CSF) examination was normal. He was given 40 mg prednisolone (o.d.) over the next two days. On day six he developed floridly psychotic symptoms. Psychiatric referral was made.

Mental state examination at this time showed an anxious, perplexed, distractible patient. He would sometimes interrupt the interview by getting up to examine some detail of his room. His speech was largely normal in form, although he frequently made irrelevant comments. He could be tearful one moment and elated the next.

He admitted to several abnormal beliefs concerning the identity of people close to him and his orientation to place. When two of his colleagues visited him he was convinced that they had been replaced by alien impostors who were physically identical and were working with the IRA. These impostors had abducted him to a place which superficially resembled a hospital ward, but in reality was the mechanics' room in a garage where he was to be held and used "as a third party to communicate between earth and their own world". He explained that these impostors used a secret staircase in the wall behind his bed. He was suspicious of his mother when she visited, remarking "you look just like my mother".

He could not detect any differences in the appearance of these people, but 'knew' that they were impostors. This belief did not extend to other friends or other family members, nor to inanimate objects. In addition, he believed that the world was running out of water and oxygen, and was about to collide with the sun. He was preoccupied with "the problem no" which he explained as follows: "In the States they reverse the words so that whenever anybody talks, 'problem no' comes out instead of 'no problem'".

He experienced auditory and visual hallucinations: he could hear 'high voices' of work colleagues in the room speaking to him and to each other. He saw black spots in the air about to descend and set fire to his bedclothes.

Cognitive testing was difficult because of the patient's distractibility. He knew the year, but not the day or month. He gave the name of the hospital correctly, but added that he was in fact in a garage. His digit span was below average. He could repeat a name and address and three objects correctly, but had no recollection of them three minutes later. His insight was limited to his concern of lack of oxygen which he regarded as a global phenomenon. Neurological examination was normal and a urine drug-screen negative. He was right handed. The psychotic phenomena, including the delusional misidentification, continued for seven days before gradual improvement on 60 mg haloperidol daily in decreasing doses.

An electroencephalogram (EEG) recorded ten days after the onset of his psychosis showed bilateral posterior theta waves which were seen less frequently on a second EEG done 12 days later. There were no focal abnormalities.

A computerised tomography (CT) brain scan done two weeks after he became psychotic showed slightly widened sulci over the vertex and a small area of diminished density in the right upper medial parietal region, without mass effect or enhancement, thought to be compatible with a resolving toxoplasma, pneumocystic or cytomegaloviral (CMV) lesion. A repeat scan nine days later showed the sulcal widening to be unchanged, but there was no longer evidence of the parietal lesion, either before or after enhancement.

Neuropsychological testing was performed three weeks after the psychotic symptoms had resolved. At testing, he was alert, co-operative and fully orientated. However, his verbal and performance IQ (Weschler Adult Intelligence Scale, WAIS-R) showed a significant decline from 113 and 110 respectively pre-morbidly to 109 and 94. This was not explained by impaired motor speed, which was above average on specific testing.

Verbal memory was intact and immediate recall of simple designs was normal. However, there was a specific visuospatial deficit for recall of patterns not available for verbal coding; in particular, recognition memory for faces was borderline. Perceptual and naming skills, and frontal lobe tests were normal.

Discussion

To our knowledge, this is the first reported case of Capgras' syndrome arising in clinical AIDS. Curiously, one of Capgras' original cases was also suffering from a sexually-transmitted disorder involving the central nervous system: neurosyphilis (Capgras *et al*, 1924). It is becoming clear that, as with syphilis, the neuropsychiatric complications of HIV infection are wide-ranging. There seems to be an increased risk of paranoid psychosis, although this may reflect the high prevalence of intracranial sequelae, particularly opportunistic infection, rather than being specific to the neurotropic virus itself (Halstead *et al*, 1988).

In the case described here, the form of the psychosis was that of an acute confusional state (ICD-9 293.0; World Health Organization, 1978), with mild global impairment of cognition and

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consciousness, labile mood and distractibility. Pyrexia, hypoxia and evidence for an intracranial infection were all present during the acute phase, resolving as the psychosis cleared. The content of the psychosis was more unusual: there was a relatively sustained delusional misidentification syndrome with features typical of a Capgras' delusion (that familiar people had been replaced by malevolent doubles) as well as a typical reduplicative paramnesia (the belief that his surroundings had also been duplicated).

Although an object relations theorist might infer much from the vignette of a homosexual man faced with a terminal illness, all the objective evidence in this case points to a primary organic aetiology. Several features are shared with previous examples in the literature. Clouding of consciousness has been noted in several cases (e.g. MacCallum, 1973). Bilateral temporal slow waves on the EEG seem to be characteristic (Christodoulou, 1977); in this case, bilateral posterior slow wave activity was noted.

The presence of reduplicative paramnesia alongside Capgras' syndrome illustrates how closely related these two traditionally distinct disorders probably are. Reduplicative paramnesia (Pick, 1903) has been considered a neurological disorder, and Capgras' syndrome a psychiatric one. Yet, the only clinical distinction between the two disorders is whether the abnormal belief involves places or people; in fact, two of Pick's original cases misidentified both. Similar explanations have been offered for the two disorders (Staton *et al*, 1982; Lewis, 1987). In some ways, the separation of the two disorders serves only to point out the often artificial boundary between psychiatry and neurology.

The radiological and neuropsychological findings in this case suggest again that there may be a localisable disturbance of function in Capgras' syndrome. A lesion was shown in the right parietal region on CT. Right-sided pathology has previously been described on neuroimaging in Capgras' syndrome (e.g. Alexander *et al*, 1979; Burns, 1985), in reduplicative paramnesia (e.g. Kapur *et al*, 1988), and in one patient showing both (Staton *et al*, 1982). The significance of the radiological findings is supported by the demonstration on careful testing of a specific neuropsychological impairment for the recall of complex visual patterns, a function of the non-dominant parietal area. This has also been reported in previous cases of Capgras' syndrome (Christodoulou, 1977; Alexander *et al*, 1979; Lewis, 1987).

In conclusion, it seems we can add Capgras' syndrome to the lengthening list of psychiatric disturbances arising in association with AIDS. In this case, the link was probably mediated by transient right-sided parietal lesion causing a subtle visuospatial amnestic deficit.

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References

ALEXANDER, M. P., STUSS, D. T. & BENSON, D. R. (1979) Capgras syndrome: a reduplicative phenomenon. *Neurology*, **29**, 334–339.

BERSON, R. J. (1983) Capgras' syndrome. *American Journal of Psychiatry*, **140**, 969–978.

BURNS, A. (1985) The oldest patient with Capgras syndrome? *British Journal of Psychiatry*, **147**, 719–720.

CAPGRAS, J. & REBOUL-LACHAUX, J. (1923) Illusion des sosies dans un delire systemise chronique. *Bulletin de la Societe Clinique de Medicine Mentale*, **2**, 6–16.

—— & CARETTE, P. (1924) Illusion des sosies et complexe d'Oedipé. *Annalès Medico-Psychologiques*, **82**, 48.

—— & LUCCINI, P. & SCHIFF, P. (1924) Du sentiment d'estrangete a l'illusion des sosies. *Bulletin de la Societe Clinique de Medicine Mentale*, **121**, 210–217.

CHRISTODOULOU, G. N. (1977) The syndrome of Capgras. *British Journal of Psychiatry*, **130**, 556–564.

DAMASIO, A. R. (1985) Prosopagnosia. *Trends in Neurosciences*, **8**, 132–133.

HALSTEAD, S., RICCIO, M., HARLOW, P., *et al* (1988) Psychosis associated with HIV infection. *British Journal of Psychiatry*, **153**, 618–623.

KAPUR, N., TURNER, A. & KING, C. (1988) Reduplicative paramnesia: possible anatomical and neuropsychological mechanisms. *Journal of Neurology, Neurosurgery and Psychiatry*, **51**, 579–581.

LEWIS, S. W. (1987) Brain imaging in a case of Capgras' syndrome. *British Journal of Psychiatry*, **150**, 117–121.

—— (1989) Capgras' syndrome. *British Journal of Psychiatry*, **154**, 270–271.

MACCALLUM, W. A. G. (1973) Capgras' symptoms with an organic basis. *British Journal of Psychiatry*, **123**, 639–642.

PICK, A. (1903) Clinical studies: III. On reduplicative paramnesia. *Brain*, **26**, 260–267.

STATON, R. D., BRUMBACK, R. A., WILSON, H. (1982) Reduplicative paramnesia: a disconnection syndrome of memory. *Cortex*, **18**, 23–26.

WORLD HEALTH ORGANIZATION (1978) *Mental Disorders: Glossary and Guide to their Classification in Accordance with the Ninth Revision of the International Classification of Diseases* (ICD–9). Geneva: WHO.

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