Refinements to captive chimpanzee (Pan troglodytes) care: a self-medication paradigm

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Abstract

In an effort to enhance welfare, behavioural management continually refines methods of non-human primate (NHP) care. Chimpanzees (Pan troglodytes) are one of the most cognitively complex captive NHPs and they have been observed to self-medicate in the wild. The population of captive chimpanzees in the US is aged (due to a breeding moratorium instituted in 1998) and will progressively require more medical care as they get older. To functionally simulate natural self-medication behaviour, provide chimpanzees with the opportunity to voluntarily participate in their own healthcare, and open new avenues of communication between caregivers and chimpanzees, we used a medication choice paradigm that allowed chimpanzees to choose their daily arthritis medication. We provided four arthritic, mobility-impaired chimpanzees with meloxicam or ibuprofen in blue or green Gatorade® to establish associations between the coloured drinks and the effects of the medications. We subsequently gave each chimpanzee a choice between the two medications. Behaviour was recorded using 15-min focal animal observations. Mobility was assessed using interactive mobility tests and a caregiver-rating system. One chimpanzee showed a medication preference (ibuprofen over meloxicam). The chimpanzees exhibited no significant behavioural or mobility differences over time, suggesting that ibuprofen and meloxicam may not differ significantly in their ability to alleviate arthritic symptoms. Whether or not the chimpanzees show a medication preference, the opportunity to make meaningful choices and the functional simulation of a complex behaviour, self-medication, is present when using this medication choice technique. Furthermore, the paradigm itself could have potential applications for additional medication options and treatment regimens.

Keywords: animal welfare, behavioural management, captivity, chimpanzees, choice, voluntary participation

Introduction

Behavioural management strategies aim to refine and improve captive non-human primate (NHP) care and enhance welfare (National Institutes of Health 2013; Schapiro 2017). As behavioural management evolves closer toward the ultimate goal of optimal care, there is an increased focus on providing animals with opportunities to make meaningful choices in captive settings. Several decades of research have outlined the welfare benefits of providing captive animals with choice in environments and/or situations, including improved physiological responses, such as reduced reactions to pain and stress (Hanson et al 1976; Mineka et al 1986; Friend 1991; Lambeth et al 2006; Leotti et al 2010; Behringer et al 2014), and improved psychological responses, such as decreased aggression, fewer abnormal behaviours, and increased social contact and play (Hanson et al 1976; Perlmuter & Monty 1977; Sambrook & Buchanan-Smith 1997; Lambeth et al 2001; Owen et al 2005; Ross 2006). Conversely, a lack of control over the environment has been linked to negative outcomes, such as helplessness and the lack of adaptive coping strategies (Tennessen 1989; Morgan & Tromborg 2007). Current research, theory, and practice are aimed at providing captive NHPs with an increased number of choices (Baker et al 2017; Schapiro et al 2017). This is reflected in the recent incorporation of the provision of opportunities for environmental choice into welfare regulations provided by the National Institutes of Health (NIH 2013), and welfare aims and objectives put forth by international animal welfare groups (Mellor 2016).

The importance of choice is also reflected in the increased implementation of positive reinforcement training (PRT) techniques to train non-human primates to voluntarily participate in health- and management-related procedures (Reinhardt 1997; Laule & Whittaker 2002, 2007; Baker et al 2007; Magden et al 2013; Reamer et al 2014; Baker 2016; Graham 2017; Magden 2017). Allowing NHPs to choose whether or not to participate in procedures has bene-