Background

Infants with autism spectrum disorders (ASD) have problems with social interaction, communication and play (Zwaigenbaum et al., 2013). Early intervention can lead to better long-term outcomes (Dawson et al., 2010). Early stimulation of joint attention (JA) skills, in particular, is associated with better language, communication and social outcomes (Warren et al., 2014; White et al., 2011).

The JASPER training (Kasari et al., 2006, 2013) focuses on Joint Attention Symbolic Play Engagement and Regulation in young children. It is a naturalistic behavioral intervention focused on the development of prelinguistic gestures (JA, requesting) and play skills within the context of play based interactions as a means to increase joint engagement between an adult and child with ASD. In the Netherlands, the JASPER training is exclusively parent-mediated. During play sessions, parents are actively coached to use strategies for setting up a learning environment, modeling and prompting for JA, expanding play, and using developmentally appropriate language (Kasari et al., 2014; Chang et al., 2016).

Objectives

1) Is the Dutch version of the JASPER training effective in infants with ASD?
2) Can we develop an observation standard to reliably assess JA amelioration?

Methods

This research was conducted in a clinical setting: the Infant team of INTER-PSY.

Infants with ASD, developmental delays and limited spoken language (2-4 years old, ADOS-2, BSID-II-NL) participated in the JASPER training. There were 15 weekly play sessions: 10 play sessions (30-45 minutes, with child & parent(s)) and 5 evaluation sessions (60 minutes, with parent(s) only). All JASPER play sessions were videotaped and later used during the evaluation sessions with parents.

There were two control groups: a clinical non-JASPER group (infants with ASD who did not receive the JASPER training) and a typically developing group (TD).

Post-treatment, parents filled in the ESCBQ (Early Social Communicative Behavior Questionnaire) and the PICS (Pictorial Infant Communication Scale), as measurements for JA and other early social communicative behaviors.

Preliminary results

Study 1: The JASPER group (n = 4) showed significantly improvement in specific JA skills at post-treatment, in comparison with the clinical non-JASPER group, as measured by 4 ESCBQ subscales (Mann Whitney: z(-2.081); z(-1.875); z(-1.979); z(-1.732); p < .05, eye contact, emotion, gaze following and showing respectively) and all 3 PICS subscales (Mann Whitney: z(-1.955); z(-1.949); z(-2.453); p < .05, initiating JA, initiating behavior request, and responding to JA respectively). Though, their skills are still at a significant lower level than that of the TD control group (ESCBQ total score; z (1.874), p <0.05; no data available concerning BICS). The data collection is ongoing (n = 20 have been collected).

In order to capture the amelioration of early social communicative behaviors over time, a qualitative coding system needed to be developed. Originally, 63 categories (31 child, 24 parent & 11 language categories) were formulated in MediaCoder, based on literature study and clinical experience. Up till now, 4 studies (Study 2-5) aimed at coding the videotaped play session behaviors have been conducted by graduate psychology students.

Study 2 (Woonink, 2015): full 5 (out of 10) JASPER play sessions (30-45 minutes) of 1 child were coded. The statistical analyses proved multiple categories to be unreliable, difficult to operationalize; there was low inter-rater reliability (IRR; 2 student raters, Cohen’s Kappa: .24-.86) and high inter- and intra-variability. Advise was to reduce the amount of categories (also 21 out of 63 categories were never used).

Study 3 (Norden, 2015): part of 10 JASPER play sessions (20 minutes: 10:00-30:00) of 2 children (incl. the child from Study 2) were coded. The qualitative coding system was reduced to 19 categories (16 child & 3 parent categories). Again IRR was low (1 student + 1 therapist rater, Cohen’s Kappa = .16-.84), also there was high inter- and intra-individual JA skills. Some trends were found, but no significant amelioration.

Study 4 (Zwaza, 2016): full 10 JASPER play sessions (30-45 minutes) of 2 new children were coded. The qualitative coding system was adjusted to 18 categories, with more emphasis on parent behavior (8 child & 10 parent categories). Again inter-rater reliability was low for child categories, though better for parent categories (2 student raters, Cohen’s Kappa = .01-.36 vs. .14-.80, respectively). Again high inter- and intra-individual variability was found (see Figure 1). Significant results were found over time (MC-analysis); more response to appeal and more responsive JA (child 3: slope = .07, p = .04; slope = .19, p = .02), less requesting and less instrumental use of other's body to communicate (child 3 & 4: slope = -.54 vs. p = .03; slope = -.38, p = .01; slope = -.17, p = .03).

Study 5 (Sikkenga, 2016): same data as in Study 4 were used. The qualitative coding system was adjusted to 19 categories, with more emphasis on language skills (10 child, 2 parent & 7 language categories). CHILDES CHAT was used to transcribe the vocalizations. Inter-rater reliability was again low for child categories, though better for parent categories (Cohen's Kappa = .10-.36 vs. .25-.80, respectively) and for language categories (77%). Significant results were found over time (MC-analysis); less babbling (child 3: slope = -.49, p = .08), more single words and more 2-word-sentences (see Figure 2; child 4: slope = 3.39, p = .01; slope = 1.86, p = .02); MLU is unchanged. Directed speech was correlated with initiating JA in both children (r = .65, p = .005; r = .54, p = .0002), with responsive JA only in 1 child (child 4: r = .40, p = .007).

Conclusions

Using the Dutch version of JASPER, preliminary results (Study 1, n=4) show that specific JA skills have ameliorated at post-treatment (ESCBQ: eye contact, emotion, gaze following & showing respectively; PICS: initiating JA, initiating behavior request & responding to JA). When repeated measurements are taken into account: amelioration in responsive JA - not in initiating JA - is found (Study 4, n=2, 10 RM). Also amelioration in language skills are found. Directed speech is correlated with JA, mainly initiating JA (Study 5).

We have found it difficult to measure JA improvement reliably using a qualitative coding system, in contrast to measuring more broad early social communicative behavior (such as language). All 4 qualitative coding system variants have low inter-rater reliability (Study 2-5), parent and language categories appear to be somewhat better (Study 4 & 5). There is also high inter- and intra-individual variability. Further research is needed, also taking into account other outcome measurements.