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中国大陆学习困难儿童韦氏智力测验对照研究的 Meta 分析

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摘要 目的 评估中国学习困难和正常儿童韦氏儿童智力量表(WISC)测量的差异。方法 检索 PubMed、MD Consult、中图公司免费外文期刊整合库(cnpLINKer)、中国知网和万方生物医学期刊数据库,检索时间均从建库至2012年5月。获得中国学习困难和正常儿童 WISC 测量的对照研究,WISC 中文版本为北京师范大学版(WISC-CR)或湖南医科大学版(C-WISC)。提取总智商(FIQ)、言语智商(VIQ)和操作智商(PIQ)。应用 RevMan 5.0 软件进行 Meta 分析,根据异质性结果选择相应的效应模型分析,并进行亚组分析。结果 23 篇文献进入 Meta 分析,研究实施地均为中国大陆;10 篇文献采用 WISC-CR,13 篇文献采用 C-WISC;12 篇文献研究现场为医院门诊或儿童保健门诊,对照组基本为来院智力检测的正常儿童;13 篇文献研究现场为学校,对照组来自同校或同班同学。①FIQ、VIQ 和 PIQ 异质性检验提示具显著异质性,均采用随机效应模型分析。Meta 分析结果显示,FIQ、VIQ 和 PIQ 的 WMD 分别为 -16.23 (95% CI: -18.20 ~ -14.25)、-18.90 (95% CI: -21.04 ~ -16.77) 和 -11.92 (95% CI: -13.90 ~ -9.94);学习困难组均显著低于对照组(P 均 < 0.000 01)。②对纳入文献的依据诊断方法、研究现场、WISC 版本行异质性原因分析,结果显示不能消除异质性。③对 VIQ 和 PIQ 各分项进行亚组分析,结果显示 VIQ 的 6 个分项(常识、类同、算数、词汇、理解、数字广度)和 PIQ 的 5 个分项(填图、排列、积木、拼图、译码)的文献间均具显著异质性,采用随机效应模型分析。Meta 分析结果显示,学习困难组 VIQ 和 PIQ 各分项得分均显著低于对照组(P 均 < 0.001)。结论 中国大陆学习困难儿童 FIQ、VIQ 和 PIQ 低于正常儿童,VIQ 的延迟发展更明显。VIQ 和 PIQ 各分项中以常识、类同、积木和译码的延迟发展更明显。

关键词 儿童; 学习困难; 智力结构; 韦氏儿童智力量表; 言语智商; 操作智商; Meta 分析

Wechsler Intelligence Scale for Children testing among Chinese children with learning difficulties: a meta-analysis

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Abstract Objective To evaluate the measurement difference in Wechsler Intelligence Scale for Children (WISC) testing for Chinese children with learning difficulties and normal children. **Methods** PubMed, MD Consult, cnpic LINK service, YZ365.com and Wanfang database were searched from the database establishment to May 2012. Studies comparing Chinese Version of WISC-III testing (modified by Beijing normal University or Hunan Medical University) between children with learning difficulties and normal children were recruited. The full intelligence quotient (FIQ), verbal IQ (VIQ) and practical IQ (PIQ) were selected as outcomes for meta analysis with RevMan 5.0. According to the heterogeneity results, corresponding effect model was chosen to conduct the meta-analysis. **Results** 23 articles were included into the meta-analysis. The research was all carried out in east-central cities of China. 10 of them used the WISC-CR, 13 used C-WISC. Thirteen studies were school-based, whereas 12 studies were carried out among hospital outpatients. The control group subjects without leaning difficulties were selected from the corresponding places. ①The heterogeneity tests of FIQ, VIQ and PIQ showed significant heterogeneity. All analyses used random effect model. Meta-analysis results showed that WMD was -16.23 (95% CI: -18.20 to -14.25), -18.90 (95% CI: -21.04 to -16.77), and -11.92 (95% CI: -13.90 to -9.94), respectively in LD (learning difficulty) group and they were lower than those of the control group significantly ($P < 0.000 01$). ②The cause of heterogeneity was analyzed by diagnosis, research field (schools or hospitals), WISC version (WISC-CR or C-WISC) and showed its existing. ③The subgroup analysis

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showed significant heterogeneity in information (I), classification (SD), arithmetic (A), vocabulary (V), comprehension (C), digit span (D) of 6 subtests of VIQ, and picture completion (PC), picture arrangement (PA), block design (BD), object assembly (OA) and coding (CD) of 5 subtests of PIQ. The results of meta-analysis showed that all kinds of scores of the LD group were significantly lower than those of the control group ($P < 0.001$). **Conclusions** FIQ, VIQ and PIQ of Chinese children with learning difficulties were lower than the normal ones, VIQ development was more delayed. The development of I, SD, A and V of all subtests were delayed significantly.

Key words Children; Learning disability; Intelligence; Wechsler Intelligence Scale for Children; Verbal intelligence; Practical intelligence; Meta analysis

儿童学习困难定义为智力正常,但听说读写存在障碍的一组症候群。1949年《韦氏儿童智力量表》(Wechsler Intelligence Scale for Children, WISC)首次出版,适用年龄为6~16岁的儿童。之后进行3次修订,1974年(WISC-R),1991年(WISC-III),2003年(WISC-IV)。WISC中文版有2个版本,均以WISC-III为蓝本,分别是WISC-CR(北京师范大学版)和C-WISC(湖南医科大学版),并进行了质量较高的建立常模的研究。WISC是迄今为止最权威和应用最广泛的儿童智力量表之一,国内外应用WISC对特殊儿童进行的调查,涉及的儿童障碍类别较为广泛,主要包括:智力落后,学习困难与学习障碍,注意缺陷多动障碍,孤独症,智力超常等,而且还包括介于普通儿童和特殊儿童之间的边缘性障碍儿童。

WISC是由英文构建的一般能力智力检测量表,至2010年在PubMed共检索到1374篇有关WISC的研究报告,英文研究文献占绝大多数,也有德文、西班牙文和荷兰文^[1-3]的报告,报告形式多采用多组问题儿童分别测量,总智商(FIQ)与英国常模均值100进行比较。中国大陆儿童智力测量多采用WISC-CR和C-WISC。中国大陆儿童学习困难的研究与国外不同,均为问题儿童与正常儿童对照研究。本研究收集相关文献,以Meta分析的方法进行定量综合,分析中国大陆儿童学习困难的智力结构,并汇总有代表性的特点。

1 方法

1.1 文献纳入标准 ①研究对象为学龄儿童(6~16岁);②民族以汉族为主;③研究类型为学习困难和正常儿童的对照研究;④WISC测量工具为WISC-CR和C-WISC;⑤对原始资料的要求:公开或未公开发表的儿童学习困难的一般智力检测,且报道FIQ、言语智商(VIQ)和操作智商(OIQ)分值或者各分项测量结果;⑥语种为中文和英文;⑦研究现场在中国大陆;⑧重复发表的文献纳入晚近发表。

1.2 文献排除标准 ①方言版研究文献;②以非正常儿童作为对照组;③仅学习困难、优秀和中等组间FIQ比较的文献。

1.3 学习困难诊断标准 ①国际疾病分类标准第10版(ICD-10);或②中国精神障碍分类标准第3版(CCMD-3)

的共性条目;或③儿童学习障碍筛查量表(The Pupil Rating Scale, PRS)总得分<65分,且言语量表分<20分;④经C-WISC或WISC-CR或其他智力筛查测验,IQ 70~85;⑤排除:感觉障碍,其他精神神经障碍,躯体疾病(多动症、器质性脑病);⑥教师评定:主科(语、数、外)平均成绩居全班第10百分位以下,或班主任评定学习障碍1年以上,或家长评定不能独立完成作业。主要诊断标准为①或②或③项;基本诊断标准为未提及①或②或③,但提及④~⑥。

1.4 文献检索方法 以Learning difficulty/学习困难、Children/儿童为中英文关键词分别检索PubMed、MD Consult、中图公司免费外文期刊整合库(cnpLINKer)、中国知网和万方生物医学期刊数据库,检索的起止时间均从建库至2012年5月。

1.5 资料提取 第一作者,发表时间,研究单位,研究对象所在地域,年龄,样本量,WISC中文版版本,诊断标准,发表形式,学习困难性质,对照组匹配条件,FIQ、VIQ和PIQ及其各分项分值。

1.6 WISC基本内容 FIQ由VIQ和PIQ组成,其中VIQ包括6项:常识、类同、算术、词汇、理解和背数;PIQ包括6项:图画补缺、图片排列、积木图案、物体拼配、译码和迷津。WISC-CR为12分测量(背数、迷津为选用),C-WISC为11分测量(不含迷津)。

1.7 文献质量评价标准 以非随机对照研究的文献评价工具(NOS)对纳入文献进行质量评价:①病例组与对照组选择方法:包括病例的定义、代表性和诊断,对照组的定义和选择;②病例组与对照组的可比性;③接触暴露评估方法:暴露的调查和评估方法;病例和对照的调查方法是否相同;应答率情况。NOS评价标准共计8项内容,满分为10分,8分以上为高质量文献,7分为较高质量文献,6分为中等质量文献,5分以下为低质量文献。

1.8 统计学方法 计量资料以加权均数差(WMD)及其95%CI表示,以漏斗图检验发表偏倚。对纳入的文献行统计学异质性分析,依据异质性进行亚组分析。采用 χ^2 检验进行统计学异质性分析, $P \leq 0.1$ 时,研究间存在显著异质性;采用 I^2 对异质性进行定量分析, $I^2 \leq 25\%$ 时,研究结果间存在低度异质性, $I^2 \sim 50\%$ 时,存在中度异质性; $I^2 > 50\%$ 时,存在高度异质性。当结果不存在异质性时采用固定效



应模型描述,反之采用随机效应模型描述。采用 RevMan 5.0 软件进行 Meta 分析, $P < 0.05$ 为差异有统计学意义。

2 结果

2.1 一般情况 初检索到 698 篇文献,23 篇文献^[4-26] 进入 Meta 分析(图 1),均为中文发表的文献。

纳入文献的基本特征如表 1 所示。3 篇文献^[4,7,23] 为硕士和博士论文。23 篇文献均来自中国中东部城市;10 篇文献采用 WISC-CR,13 篇文献采用 C-WISC。12 篇文献研究现场为医院门诊或儿童保健门诊,对照组均为来院智力检测的正常儿童;11 篇文献研究现场为学校,对照组或为同班或同校同学。10 篇文献符合主要诊断标准,12 篇文献满足基本诊断标准,1 篇文献^[5] 未提及。病例组总样本量 1 872 例,男女比 3:1,对照组总样本量 1 894 例,男女比 3:1。

2.2 文献质量评价 文献^[5] 未描述学习困难儿童的诊断标准,余 22 篇文献均描述;医院研究现场均未描述是否为连续病例;纳入对照组的定义和选择均恰当,其中 11 篇文献来自学校,两组在年龄或年级等因素均具可比性;两组 WSCI 均采用相同的量表检测;均未描述应答率的情况,描述测量时均未采用盲法。NOS 评分 8 分 3 篇文献^[9,11,21];7 分 5 篇文献^[4,7,19,22,23];6 分 13 篇文献^[6,8,10,13-18,20,24-26], ≤5 分 2 篇文献^[5,12]。

表 1 纳入 23 篇文献的基本情况
Tab 1 Characteristics of 23 included literatures

Study	Location	WISC version		Diagnosis	Learning disability group		Control group		
		Population source	Male/Female		Age or grade	Population source	Male/Female	Age or grade	
Li 2002 [4]	Guangxi	WISC-CR	32/10	①	Survey	7.8-12.1 y (mean:10.7)	Same class	25/5	7.3-11.9 y (mean:10.4)
Zhang 2001 [5]	Jinan	C-WISC	42/26	Non	Out-patient	6-15.5 y (mean:9.9)	Same school	26/18	6-15.5 y (mean:10.4)
Yao 2003 [6]	Wuhan	C-WISC	49/23	③④⑤⑥	Out-patient	(9.48 ± 1.58) y	Out-patient	98/46	(9.52 ± 1.56) y
Han 2005 [7]	Wuhan	C-WISC	50/15	①③④⑥	Primary school	Grade 4-6	Same class	50/15	Grade 4-6
Fan 2003 [8]	Suzhou	C-WISC	24/4	⑥	Out-patient	8-12 y	NA	12/8	Same age
Fan 2001 [9]	Guangzhou	C-WISC	31/14	①②④⑤	Primary school	Grade 2-5	Same class	29/15	(9.87 ± 1.65) y
Wang 2006 [10]	Guangzhou	C-WISC	40/10	①④⑤⑥	Out-patient	Grade 3-6	Primary school	40/10	Grade 3-6
Zhang 2004 [11]	Heilongjiang	WISC-CR	37/18	①②④⑤⑥	Middle school	Grade 7-9	Same school	55	Grade 7-9
Ji 2000 [12]	Shanghai	WISC-CR	142/43	④⑤⑥	Out-patient	(10.2 ± 2.2) y	Primary/middle school	142/43	(10.3 ± 2.4) y
Ding 2002 [13]	Shanghai	WISC-CR	47/15	④⑤⑥	Primary school	Grade 1-4 (8-14 y)	Same class	60/20	Grade 1-4 (8-14 y)
Wang 2003 [14]	Shanxi	C-WISC	52/29	④⑤⑥	Out-patient	Grade 3-6 (6-12 y)	Out-patient	38/26	7-15 y
Tao 1995 [15]	Hefei	WISC-CR	63/40	④⑤⑥	Primary school	Grade 1-5 (9-14 y)	Primary school	63/40	Grade 1-5 (9-14 y)
Chen 1993 [16]	Changsha	WISC-CR	59/34	④⑤⑥	Primary school	Grade 4-6 (8-13 y)	Same class	84/46	Grade 4-6 (8-13 y)
Zhang 2002 [17]	Hebei	C-WISC	75 (all)	④⑥	Out-patient	6.5-12 y	Primary school	60 (all)	6.5-12 y
Wang 2004 [18]	Enshi	C-WISC	50/18	④⑤⑥	Out-patient	Grade 1-5	Out-patient	45/15	Grade 1-5
Ju 1999 [19]	Fuzhou	WISC-CR	135/66	④⑤⑥	Primary/middle school	7-14 y	Same class	246/152	7-14 y
Li 2003 [20]	Guangzhou	C-WISC	49/17	④⑤⑥	Out-patient	(10.7 ± 2.6) y	Out-patient	25/11	(11.0 ± 2.3) y
Chen 2002 [21]	Changsha	C-WISC	109/63	①③④⑤⑥	Patient/primary school	Grade 3-6 (10 y)	Primary school	35/26	10 y
Chen 2006 [22]	Shanghai	WISC-CR	47/14	①	Out-patient	(9.83 ± 1.46) y	Out-patient	33/14	(9.28 ± 1.45) y
Xu 2004 [23]	Benbu	WISC-CR	63 (all)	②	Out-patient	Not stated	Out-patient	100 (all)	Not stated
Liu 2000 [24]	Beijing	WISC-CR	30/12	④⑤⑥	Primary school	Grade 3-5	Same class	30/12	Grade 3-5
Liu 2002 [25]	Changsha	C-WISC	40 (all)	④⑤⑥	According marks	Grade 4-6	According marks	40 (all)	Grade 4-6
Xu 2009 [26]	Guangzhou	C-WISC	22/13	①②③④⑤⑥	Out-patient	(9.90 ± 1.52) y	Primary school	35 (all)	Grade 1-6

Notes: y: years; ① ICD-10; ② CCMD-3; ③ The scores of the Pupil Rating Scale were below 65, and the scores of verbal scale were below 20; ④ IQ from 70 to 85 according to C-WISC or WISC-CR or other intelligence test; ⑤ Sensory disturbances, other neuropsychiatric, attention deficit hyperactivity disorder and organic brain were excluded; ⑥ Teacher's judgement; the average scores of main subjects (language, maths and foreign language) were below 10th percentile in the the whole class, or teacher judged the child had learning disability for more than 1 year, or parents considered the child could not work independently

Selected participants

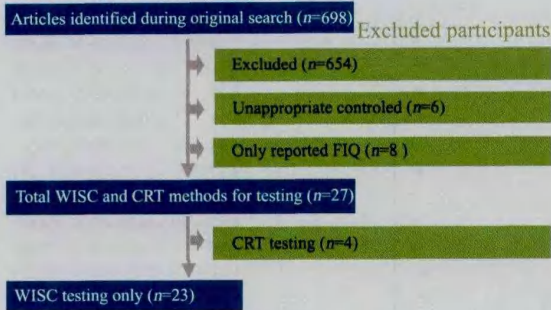


图1 文献检索流程图

Fig 1 Identification process for eligible studies

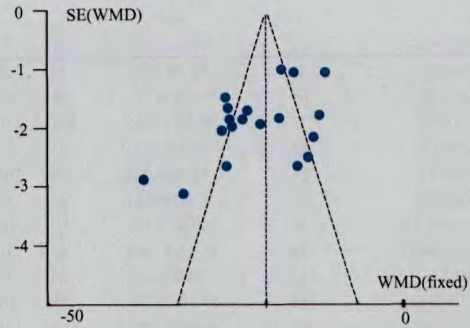


图2 FIQ的漏斗图

Fig 2 Funnel plots for FIQ

2.3 Meta 分析结果

2.3.1 发表偏倚 对报道 FIQ 的 23 篇文献行漏斗图检验 (图 2), 显示图形不对称, 可能存在发表偏倚。

2.3.2 FIQ、VIQ 和 PIQ 的 Meta 分析结果 2 篇文献^[16,19]未报道 FIQ、VIQ 和 PIQ, 对余 21 篇文献的结果进行定量综合。异质性检验 I^2 分别为 85.5%、86.6% 和 84.4%, 研究间均存在显著的统计学异质性, 均采用随机效应模型合并结果。Meta 分析结果显示 (图 3 ~ 5), FIQ、VIQ、PIQ 的 WMD 分别为 -16.23 (95% CI: -18.20 ~ -14.25)、-18.90 (95% CI: -21.04 ~ -16.77) 和 -11.92 (95% CI: -13.90 ~ -9.94); 学习困难组均显著低于对照组, P 均 < 0.000 01。

2.3.2 异质性原因分析 由于纳入文献间 FIQ、VIQ 和 PIQ 异质性非常显著, 可能与以下因素有关: ①诊断标准有差异, 10 篇文献符合主要诊断指标, 12 篇文献符合基本诊断标准, 1 篇文献未提及采用何诊断标准; ②研究的现场不同, 12 篇文献来自于医院现场, 11 篇文献为学校现场, 学校现场对照组匹配条件明显好于医院现场对照组; ③WSIC 中文版测量版本不同, 10 篇文献采用 WISC-CR, 13 篇文献采用 C-WISC。依据以上因素对 FIQ、VIQ、PIQ 进行敏感性检验, 逐一排除可能造成异质性的原因。结果显示, 按以上因素行亚组分析后, I^2 均 > 50%, P 均 < 0.000 01, 提示文献间仍具显著的异质性 (表 2), 但 Meta 分析结果无显著改变, 即 FIQ、VIQ 和 PIQ 学习困难组均显著低于对照组。

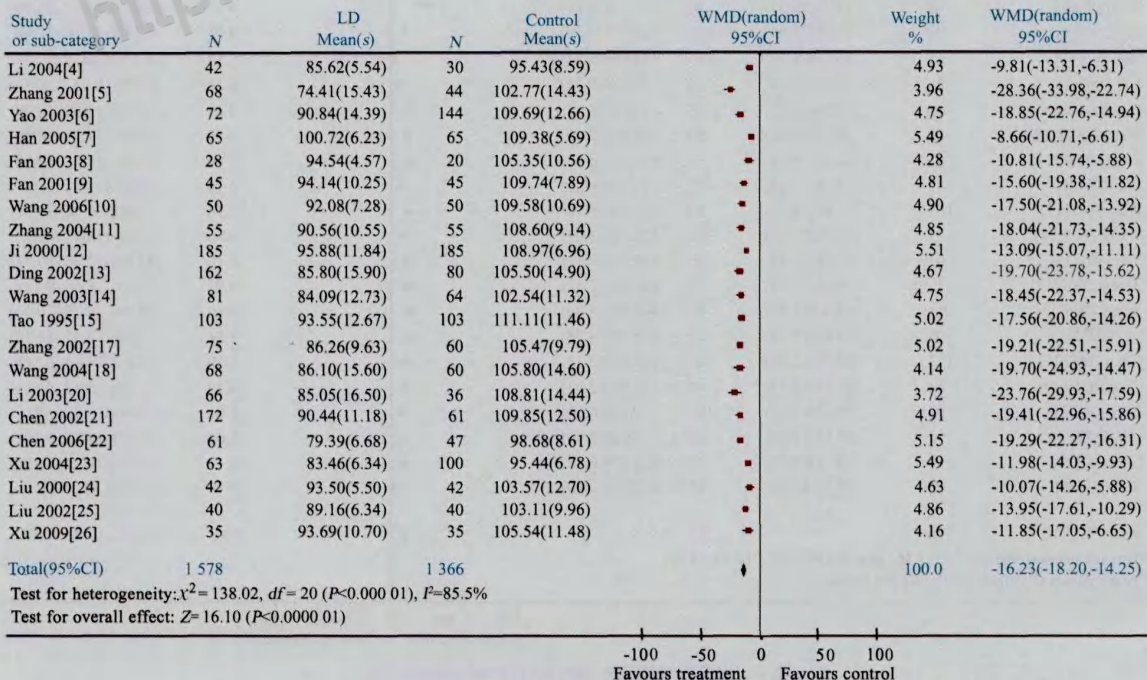


图3 学习困难组和对照组 FIQ 比较的 Meta 分析

Fig 3 Meta-analysis of FIQ between the learning difficulty group and control group

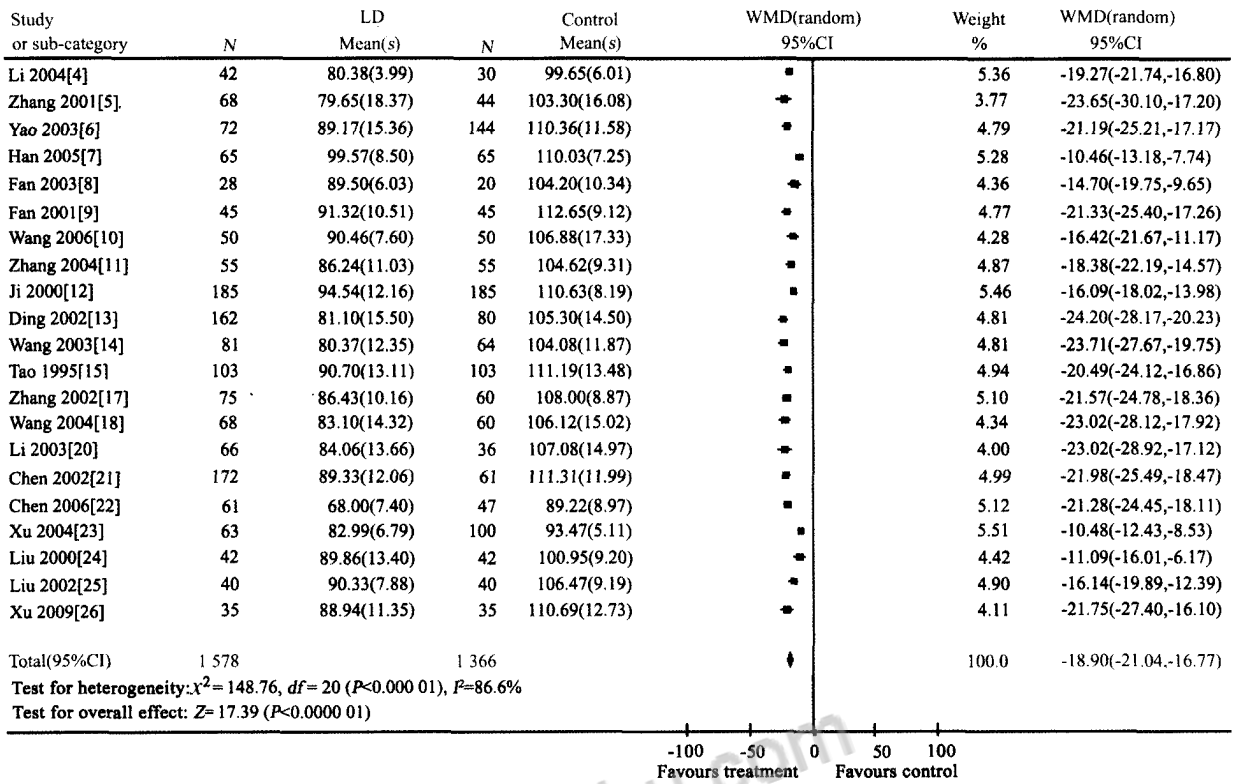


图 4 学习困难组和对照组 VIQ 比较的 Meta 分析

Fig 4 Meta-analysis of VIQ between the learning difficulty group and control group

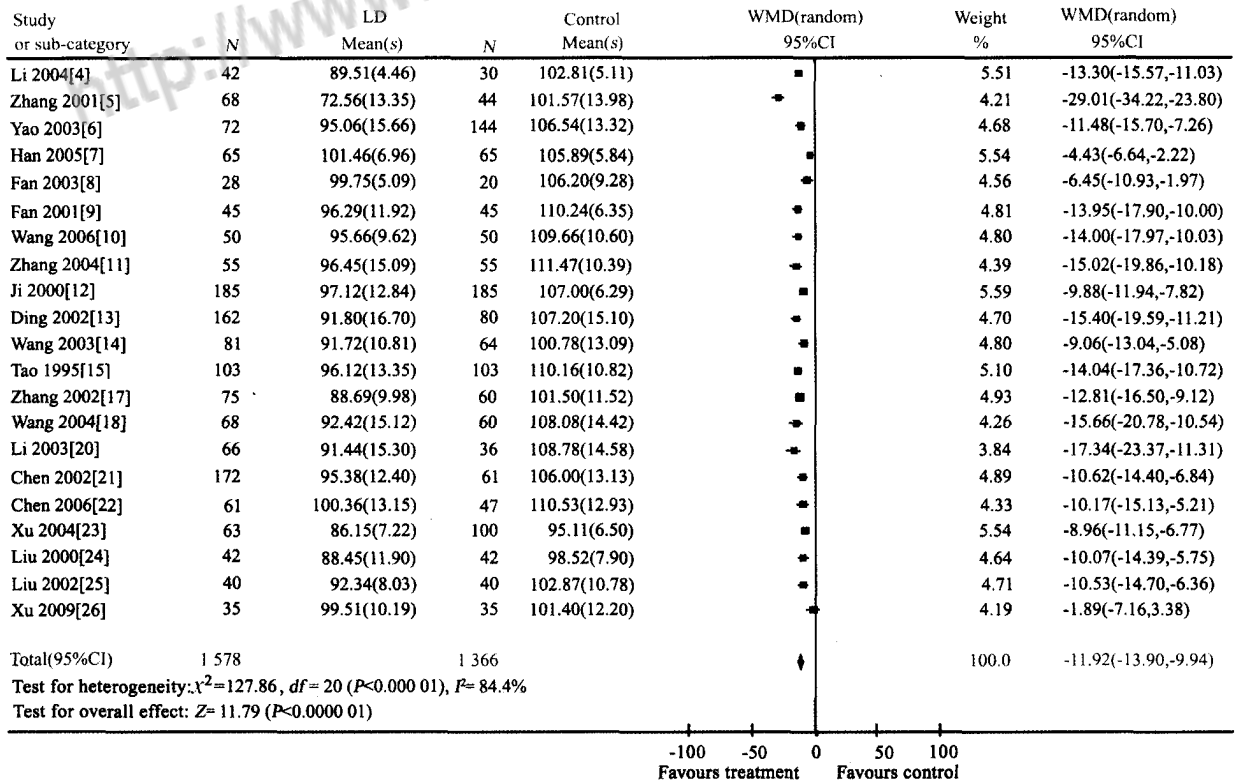


图 5 学习困难组和对照组 PIQ 比较的 Meta 分析

Fig 5 Meta-analysis of PIQ between the learning difficulty group and control group

表2 FIQ、VIQ和PIQ文献异质性的亚组分析
Tab 2 Analysis of heterogeneity in FIQ, VIQ and PIQ between subgroups

Subgroup	Studies	Heterogeneity		WMD(95% CI)	P
		P	I ² /%		
FIQ					
WISC-CR	[5-10,14,17,18,20,21,25,26]	<0.000 01	83.3	-14.29(-15.31,-13.28)	<0.000 01
C-WISC	[4,11-13,15,16,19,22-24]	<0.000 01	87.2	-15.43(-16.46,-14.39)	<0.000 01
School children	[4,7,9,11,13,15,16,19,21,24,25]	<0.000 01	85.5	-12.90(-13.94,-11.86)	<0.000 01
Out-patient	[5,6,8,10,12,14,17,18,20,22,23,26]	<0.000 01	74.1	-17.92(-19.04,-16.81)	<0.000 01
ICD-10/CCMD-3/PRS	[4,6,7,9,10,11,21-23,26]	<0.000 01	83.9	-14.47(-15.23,-13.71)	<0.000 01
Not ICD-10/CCMD-3/PRS	[5,8,12-20,24,25]	<0.000 01	90.6	-18.87(-21.33,-16.40)	<0.000 01
VIQ					
WISC-CR	[5-10,14,17,18,20,21,25,26]	<0.000 01	90.7	-16.46(-17.46,-15.46)	<0.000 01
C-WISC	[4,11-13,15,16,19,22-24]	<0.000 01	81.3	-18.89(-20.03,-17.75)	<0.000 01
School children	[4,7,9,11,13,15,16,19,21,24,25]	<0.000 01	91.6	-15.66(-16.72,-14.61)	<0.000 01
Out-patient	[5,6,8,10,12,14,17,18,20,22,23,26]	<0.000 01	70.9	-19.44(-20.51,-18.36)	<0.000 01
ICD-10/CCMD-3/PRS	[4,6,7,9,10,11,21-23,26]	<0.000 01	87.6	-17.25(-18.03,-16.46)	<0.000 01
Not ICD-10/CCMD-3/PRS	[5,8,12-20,24,25]	<0.000 01	68.5	-20.20(-22.70,-17.70)	<0.000 01
PIQ					
WISC-CR	[5-10,14,17,18,20,21,25,26]	<0.000 01	61.6	-11.4(-12.44,-10.36)	<0.000 01
C-WISC	[4,11-13,15,16,19,22-24]	<0.000 01	88.9	-10.38(-11.47,-9.29)	<0.000 01
School children	[4,7,9,11,13,15,16,19,21,24,25]	<0.000 01	86.7	-10.49(-11.54,-9.45)	<0.000 01
Out-patient	[5,6,8,10,12,14,17,18,20,22,23,26]	<0.000 01	83.8	-11.37(-12.43,-10.29)	<0.000 01
ICD-10/CCMD-3/PRS	[4,6,7,9,10,11,21-23,26]	<0.000 01	77.6	-10.55(-11.34,-9.76)	<0.000 01
Not ICD-10/CCMD-3/PRS	[5,8,12-20,24,25]	<0.000 01	95.3	-14.56(-17.06,-12.06)	<0.000 01

2.3.3 VIQ和PIQ各分项的Meta分析结果 VIQ的6个分项和PIQ的5个分项的文献间均具显著异质性,均采用随机效应模型分析。Meta分析结果显示,学习困难组VIQ和PIQ各分项得分均显著低于对照组(P均<0.001),其中

VIQ分项中以常识(WMD=-3.20)、类同(WMD=-3.09)和算数(WMD=-2.93),PIQ分项中以积木(WMD=-2.15)和译码(WMD=-2.06)较对照组发展更为延迟(表3)。

表3 VIQ和PIQ各分项的Meta分析结果
Tab 3 Meta-analysis of the subtests of VIQ and PIQ

Subgroup	Studies	Heterogeneity		WMD(95% CI)	P
		P	I ² /%		
VIQ					
Information	[4-26]	<0.000 01	88.1	-3.20(-3.63,-2.76)	<0.000 01
Classification	[4-26]	<0.000 01	99.4	-3.09(-4.95,-1.23)	<0.000 01
Arithmetic	[4-26]	<0.000 01	93.2	-2.93(-3.54,-2.33)	<0.000 01
Vocabulary	[4-26]	<0.000 01	91.1	-2.72(-3.24,-2.21)	<0.000 01
Comprehension	[4-26]	<0.000 01	83.3	-2.13(-2.50,-1.75)	<0.000 01
Digit Span	[4,6,7,9,10,12,14-21,24-26]	<0.000 01	89.9	-2.67(-2.50,-1.75)	<0.000 01
PIQ					
Picture completion	[4-26]	<0.000 01	88.8	-1.77(-2.25,-1.29)	<0.000 01
Picture arrangement	[4-26]	<0.000 01	82.0	-1.53(-1.94,-1.13)	<0.000 01
Block design	[4-26]	<0.000 01	97.0	-2.15(-3.11,-1.18)	<0.000 01
Object assembly	[4-26]	<0.000 01	89.0	-1.58(-2.09,-1.07)	<0.000 01
Coding	[4-11,13,14,16-26]	<0.000 01	96.2	-2.06(-3.02,-1.11)	<0.000 01

3 讨论

本Meta分析纳入26篇非随机的对照文献,从文献质量评价上看,仅9/26篇文献的诊断标准较为全面,提示存在一定的选择偏倚;纳入对照组的定义和选择虽然恰当,与学习困难组均具可比性,但医院现场的对照组匹配条件明

显不如学校现场对照组匹配条件;均未描述测量时是否采用盲法,测量偏倚的可能性大。本Meta分析总体上的证据强度为中等。

异质性检验提示FIQ、VIQ和PIQ的文献间均有高度的异质性(I²>50%),本研究从诊断标准(全面或缺)、



研究现场(学校或医院)、检测方法(WISC-CR或C-WISC)方面行亚组分析,试图分析异质性的原因。但亚组分析结果显示文献间仍存在高度的异质性,说明剔除上述因素仍不能纠正产生异质性的原因,考虑可能与其他因素有关?如儿童的心理语言能力^[27]或儿童营养状况^[28]等,有待进一步研究。

目前认为,影响儿童学习困难的因素是多方面的,而智力水平是其中一个重要因素,且与学习成绩呈正相关^[29-32],即智力水平较低者较易出现学习困难。本Meta分析结果显示,学习困难组和对照组的WMD为-16.23(95%CI: -18.20 ~ -14.25),即学习困难儿童FIQ平均较对照组低16分,约为常模的1个标准差(15分),且与纳入单篇文献的结果一致,支持学习困难儿童的智力水平略低于正常儿童。分析纳入Meta分析的各篇文献,学习困难组FIQ除文献^[7]>100分外,余25篇文献均<95分,其中4篇文献^[5,14,22,23]<85分;对照组FIQ除文献^[4,22,23]<100分,余23篇均>100分;提示学习困难儿童与同龄儿童比较,由于智能的不足,在学习技能上已有较显著的落后现象。

目前,以VIQ和PIQ差值绝对值>12作为衡量智力发展平衡性指标^[33]。进一步分析智力结构,学习困难组VIQ和PIQ平均较对照组低-18.90(95%CI: -21.04 ~ -16.77)和-11.92(95%CI: -13.90 ~ -9.94),两者差值在7分,尚未达到12分的临界值,其中仅文献^[22]VIQ和PIQ的差值为32分,存在显著的言语和操作发展不均衡,考虑与纳入学习困难儿童FIQ水平较低(平均79分)有关,该研究FIQ71~85分占77.1%。进一步分析纳入的文献,17篇文献^[4,6,10,12-15,17,18,21-24]报道学习困难组和对照组VIQ和PIQ发展不均衡的比例差异有统计学意义,提示学习困难儿童更容易出现言语和操作不均衡。

学习困难儿童VIQ和PIQ各分项较对照组均有发展延迟,其中VIQ分项测量中以常识和类同更易出现延迟,常识反映智力的高低和知识面的广度,类同体现了儿童的概念形成与发展。PIQ的分项测量中以积木和译码的延迟为著,反映视知觉和分析能力、空间定向能力及协调能力;这4项的延迟可导致加工信息能力的欠缺,体现在听、说、读和写能力的减低,从而表现为学习成绩低下。因此,对此应展开有针对性的训练,提高学习困难儿童的学习能力。

4 结论

中国大陆学习困难儿童FIQ、VIQ和PIQ低于正常儿童,VIQ的延迟发展更明显。各分项中以常识、类同、积木和译码的延迟发育更明显。

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